RUBBER and PLASTICS WEEKLY

VOLUME 141 NO. 26 DECEMBER 23 1961 ONE SHILLING

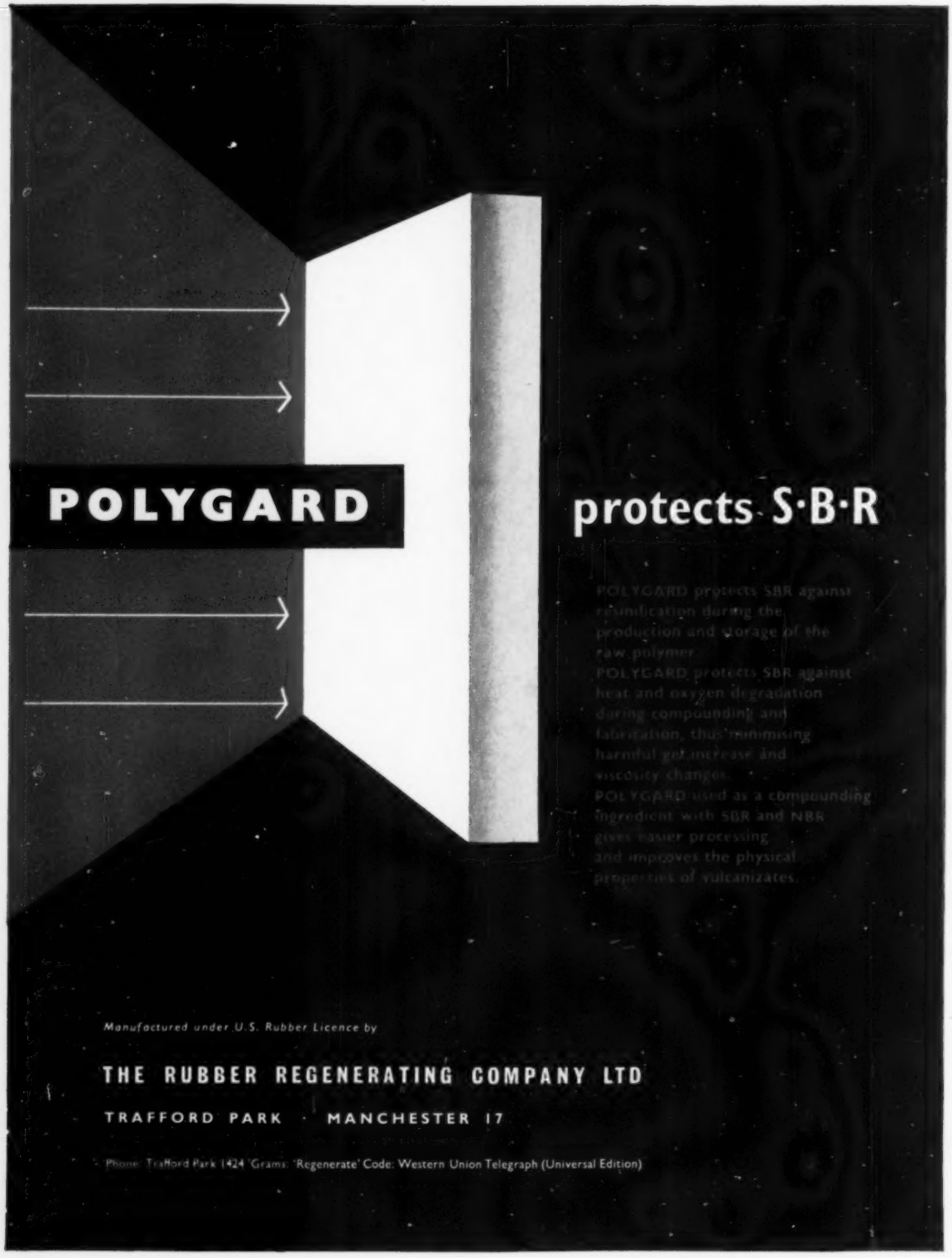
I.S.R. PLEASE!

Unparalleled technical service for SB Rubber users from Britain's large scale producer

For INTOL or INTEX phone

The International Synthetic Rubber Company Ltd.

Southampton · BLACKFIELD 3141
Manchester · PYRAMID 1241
London · LANGHAM 0711


POLYGARD
protects S·B·R
POLYGARD protects SBR against peptisation during the production and storage of the raw polymer.
POLYGARD protects SBR against heat and oxygen degradation during compounding and fabrication, thus minimising harmful gel increase and viscosity changes.
POLYGARD used as a compounding ingredient with SBR and NBR gives easier processing and improves the physical properties of vulcanizates.
Manufactured under U.S. Rubber Licence by
THE RUBBER REGENERATING COMPANY LTD
TRAFFORD PARK · MANCHESTER 17
Phone: Trafford Park 1424 Grams: 'Regenerate' Code: Western Union Telegraph (Universal Edition)

Your SUPPLIER ?

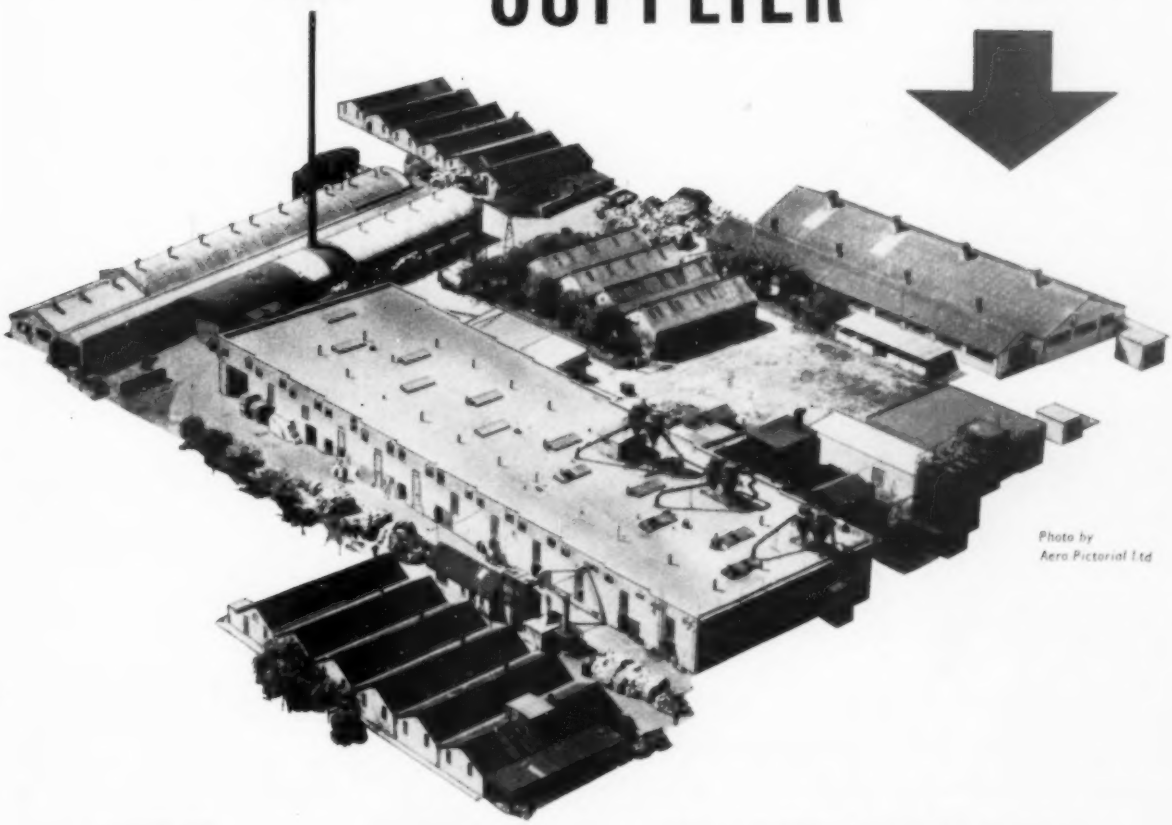


Photo by
Aero Pictorial Ltd

Ebonite DUST

In all qualities to meet your specification

THE LARGEST PRODUCERS JAMES FERGUSON & SONS LTD

LEA PARK WORKS PRINCE GEORGE'S RD · LONDON, S.W 19
TEL: MITCHAM 2283-7 : GRAMS: NESTORIUS, SOUPHONE, LONDON
Sales Offices and Stores in BIRMINGHAM and MANCHESTER

also the makers of:-

NESTORITE PHENOLIC UREA MOULDING MATERIALS AND NESTOR RESINS AND EMULSIONS

TUFTED CARPET YARNS AND COTTON AND SYNTHETIC FABRICS FOR THE RUBBER ELECTRICAL AND CHEMICAL TRADES

JOHN BRIGHT & BROTHERS LTD.

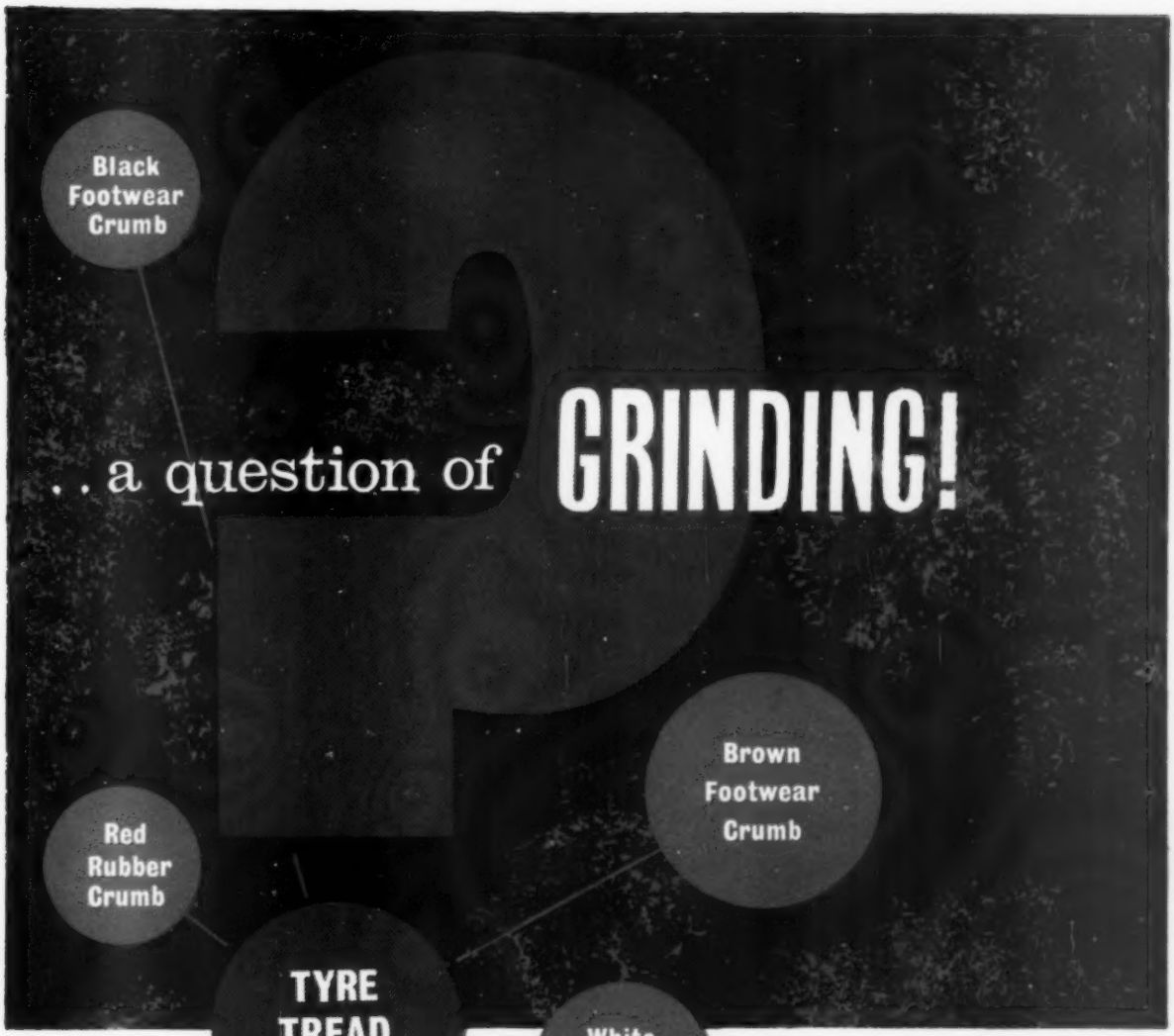
SPINNERS DOUBLERS AND MANUFACTURERS

ROCHDALE

TELEPHONE: ROCHDALE 4141 (5 LINES)

TELEGRAMS: 'BRIGHTS' ROCHDALE

ESTD. 1809



STANDARD MESH SIZES :
18's 20's 24's 30's

. . . and the B.R.R. group have the answers. For over 80 years we have been solving problems of grinding for many well-known manufacturers whose products are household words. A wealth of knowledge and experience is therefore available to you. New laboratories with the very latest equipment back our technical service which is at your disposal.

All enquiries welcomed by :

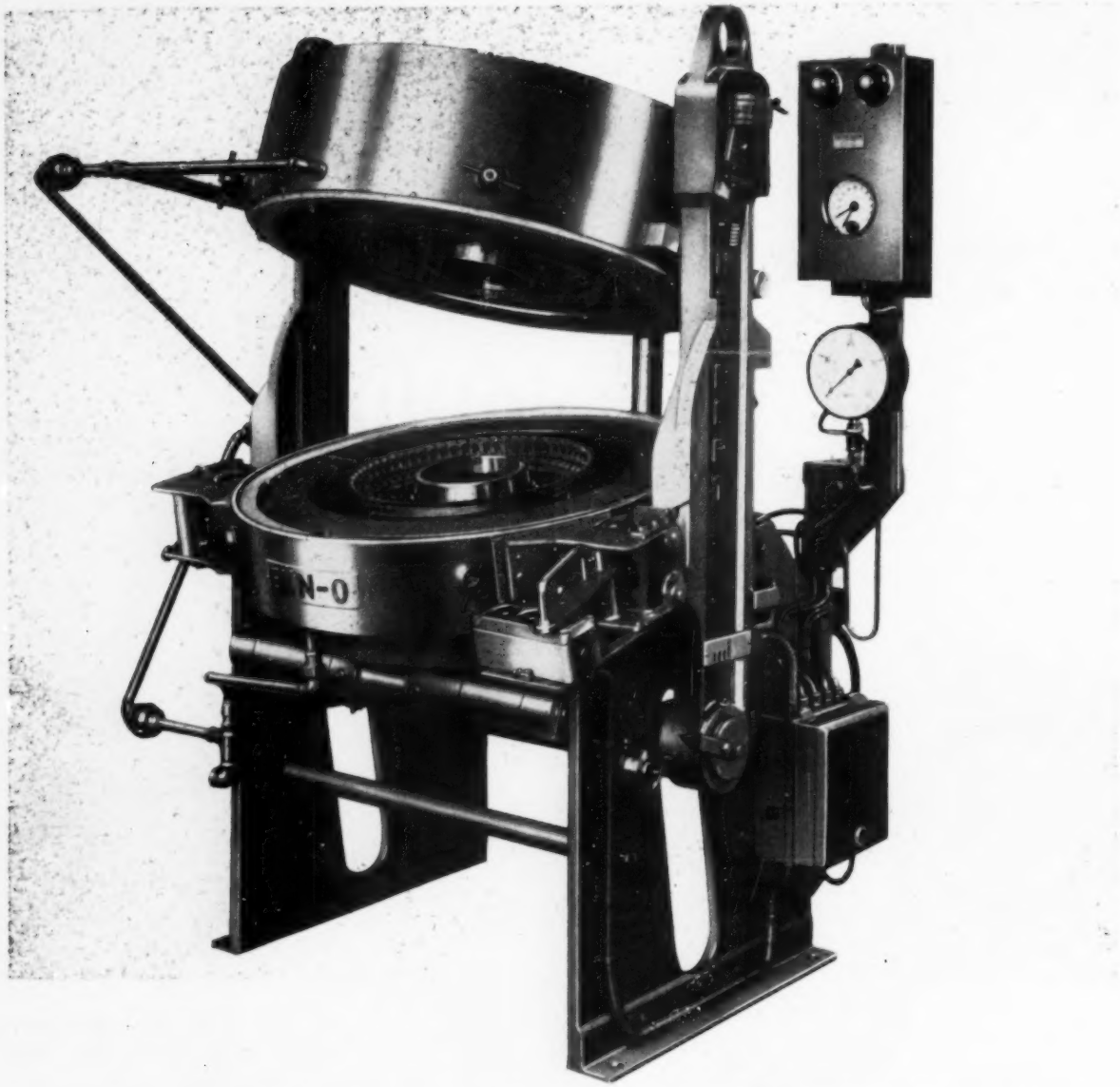
BRITISH RECOVERED RUBBER AND CHEMICAL COMPANY LIMITED

ASHTON NEW ROAD · CLAYTON · MANCHESTER 11
Telephone: EASt 3241/6 Telegrams: 'Reclaimed' Manchester

GLASGOW OFFICE: 178 FULTON STREET, GLASGOW, W.3
Telephone: Jordanhill 9508/9 Telegrams: Jagardi, Glasgow

ASSOCIATED COMPANIES
•
JOSEPH ANDERSON & SONS LTD.
•
IRKDALE INDUSTRIES LTD.

BRR



RETREADERS! 50% INCREASE IN OUTPUT – PLUS A REDUCTION IN COSTS!

THE BRILLIANT HERBERT EKN RETREAD PRESS It's been calculated that in the time a conventional vulcanizer requires to cure 4 car tyres the Herbert EKN cures **6** — an output increase of 50%. In actual tests, an old-fashioned, swivel-bolt vulcanizer had a manufacturing cycle of 57 minutes. The EKN did the whole job in 38 minutes.

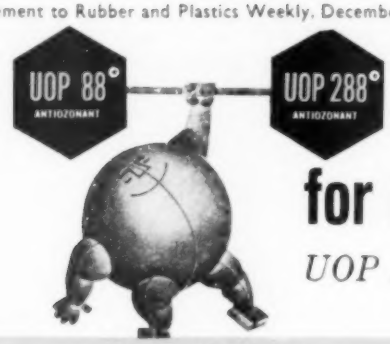
SAFE AND CERTAIN The laborious extraction of tyres by levers often results in damage to expensive moulds and in tyre injuries. Damaged moulds, of course, spoil the appearance of every tyre. But in the EKN vulcanizer, a special curved roller track carefully strips the tyre from the mould. The operator has only to take it away. And spraying of the mould helps to make the operation easier still.

QUICK AND EASY Moulds are changed in the shortest possible time, and the most difficult part of the work, the lifting of the mould from the heating chamber, is done by the model EKN vulcanizer itself — an amazingly simple operation. To savings in labour add savings in steam, power and space.

HERBERT MACHINERY IS NOW MANUFACTURED IN ENGLAND UNDER LICENCE
Write now for further details to:

BAKER PERKINS Ltd

Westwood Works Peterborough



for complete ozone protection...

UOP Antiozonants and the UOP Field Specialist

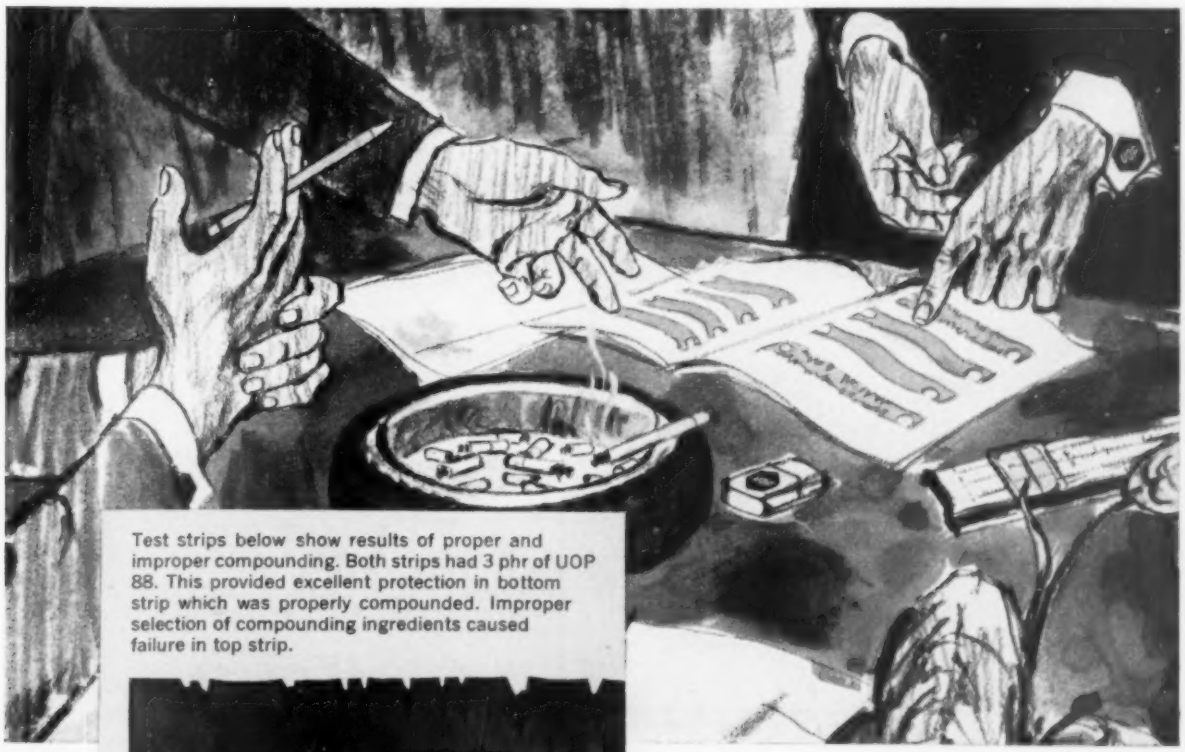
Increasing ozone concentrations in many areas make it more and more necessary that your products have the best possible protection against ozone cracking.

Excellent chemical antiozonants...UOP 88 and 288 . . . that have proven their effectiveness in hundreds of challenging applications are readily available.

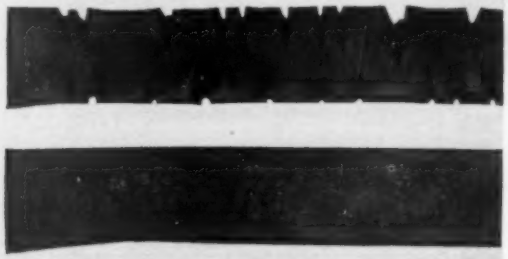
But in protecting against ozone attack, an outstanding antiozonant is only the beginning of the story. The type of natural or synthetic polymer used . . . the curing system . . . the reinforcing agent . . . the service conditions under which the product is to be used . . . all of these factors must be correctly interpreted, co-ordinated, and balanced to provide the most effective protection.

That's where the services of UOP's Field Specialist become important. Qualified by training and long personal experience, he can draw on the results of years of continuous research and testing at UOP's laboratories . . . covering the use of thousands of antiozonant formulations on a wide variety of base stocks. His recommendations may necessarily cover many phases of your operation . . . and they will represent the latest, most effective method of combating the ozone problem for greater customer satisfaction.

To arrange for an early visit from a UOP Field Technical Engineer, without any obligation, call or write our Products Department today.



Test strips below show results of proper and improper compounding. Both strips had 3 phr of UOP 88. This provided excellent protection in bottom strip which was properly compounded. Improper selection of compounding ingredients caused failure in top strip.



UNIVERSAL OIL PRODUCTS COMPANY

30 Algonquin Road
Des Plaines, Illinois, U. S. A.

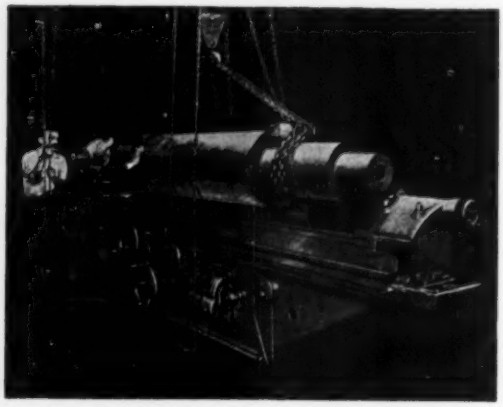
WHERE RESEARCH IS PLANNED WITH PROGRESS IN MIND

*Registered Trademark Universal Oil Products Co.

Available in England through **UNIVERSAL-MATTHEY PRODUCTS LIMITED**, Stockingswater Lane, Brimsdown, Enfield, Middlesex
Telephone: Howard 4066-7-8. Cables and Telegrams: Unimatthey, Enfield. Registered Office: 78 Hatton Garden, London, E.C.1

A1

MILLS CONVERTED TO NEW SAFETY STANDARDS



INSTALLATION MAINTENANCE

REPAIRS NEW MACHINES

SPARE PARTS FOR ALL TYPES OF INDUSTRIAL PLANT

UNITS HANDLED UP TO FOUR TONS

•

ROLL GRINDING A SPECIALITY

JAMES H. PULLEN (1942) LTD.

ROTHERMERE ROAD WADDON SURREY *Telephone: Croydon 6067/8*

Very material to your needs

Formapex

Synthetic Resin Bonded

LAMINATES

Formapex is tough, stable, unaffected by heat or moisture. It has a high strength/weight ratio, and is resistant to dilute chemicals and organic solvents. It can be punched or machined and has good electrical insulating properties. Paper and fabric base grades are manufactured to meet all appropriate British Standards. For electrical and mechanical engineers Formapex can solve many problems. Please write for Technical Brochure 11L.

IOCO LIMITED
ANNIESLAND, GLASGOW, W.3
Telephone: Scotstoun 5501/6

PLANTATION RUBBER

• • •

RUBBER LATEX

• • •

All grades

For samples and prices please write to :

HILTON, WALLACE & CO. LTD

St. Dunstan's House

IDOL LANE, LONDON, E.C.3

***Telephone : MANsion House* 1005**

factice

FOR HOME AND EXPORT

Grades: WHITE · GOLDEN · BROWN · SPECIAL

EXTENDS
PLASTICISES
SOFTENS
AIDS PROCESSING
GIVES "FEEL"
RESTRAINS BLOOM

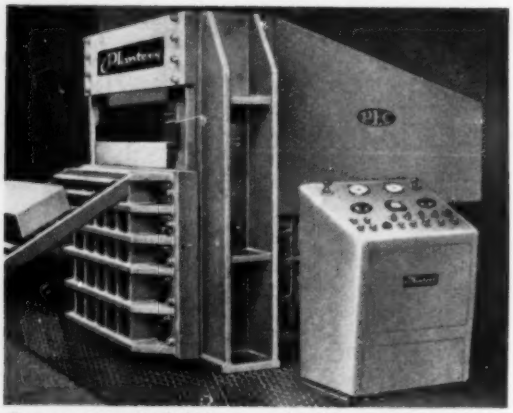
All grades made under strict technical control and uniformity guaranteed. Our Technical Department is at your service.

as ALFRED SMITH LTD · STONEFERRY · HULL

Telephone: Central 41311 (9 lines) Telex No. 52266 Cables: "Bisulphide" Hull

WORKS: Oak Road, Newland, Hull · Telephone: Central 15880
LONDON: 88 Leadenhall Street, E.C. · Telephone: Avenue 4081/3

SYNTHETIC RUBBER
AUTO BALER



★ Output—outstandingly high
★ Dwell—infinitely adjustable
★ Safety Guards—fully interlocked
★ Operation—completely automatic
★ Bales—high density and permanently shaped
★ Flashing—barely perceptible
★ Construction—robust and independently powered

Planters

PLANTERS ENGINEERING CO. LTD.

109, Uxbridge Road, Ealing, London, W.5 Phone: EALing 6062/3

(Associated with ENTWISLE & GASS LTD.)

Exclusive Compounds

NATURAL or SYNTHETIC
for particular purposes

e.g. Tank Lining
Precision Mouldings
Gaskets and Jointings
Butyl Neoprene and Hypalon applications

Enquire

HATCHAM RUBBER
COMPANY LIMITED

PRINCES WAY, WADDON, CROYDON, SURREY
CROydon 6054/56

RUBBER AGE

(NEW YORK)

One of the World's Outstanding Rubber Journals

Keep up with developments in the rubber industry in the U.S.A. and Canada. A subscription to RUBBER AGE (no affiliation with any other rubber journal) will provide you with the latest information on technical advances — news — markets — statistics.

Rubber . . . latex . . . vinyls . . . polyethylene and other rubberlike materials fully covered in every issue.

If you have not seen a recent copy of RUBBER AGE, send today for a specimen copy.

Published monthly, subscription price : $6.00 per year in England and the Continent.

Also Publishers of the

RUBBER RED BOOK

The only Directory of the Rubber Industry in the United States and Canada.

1962 Edition,
$15.00 post paid.

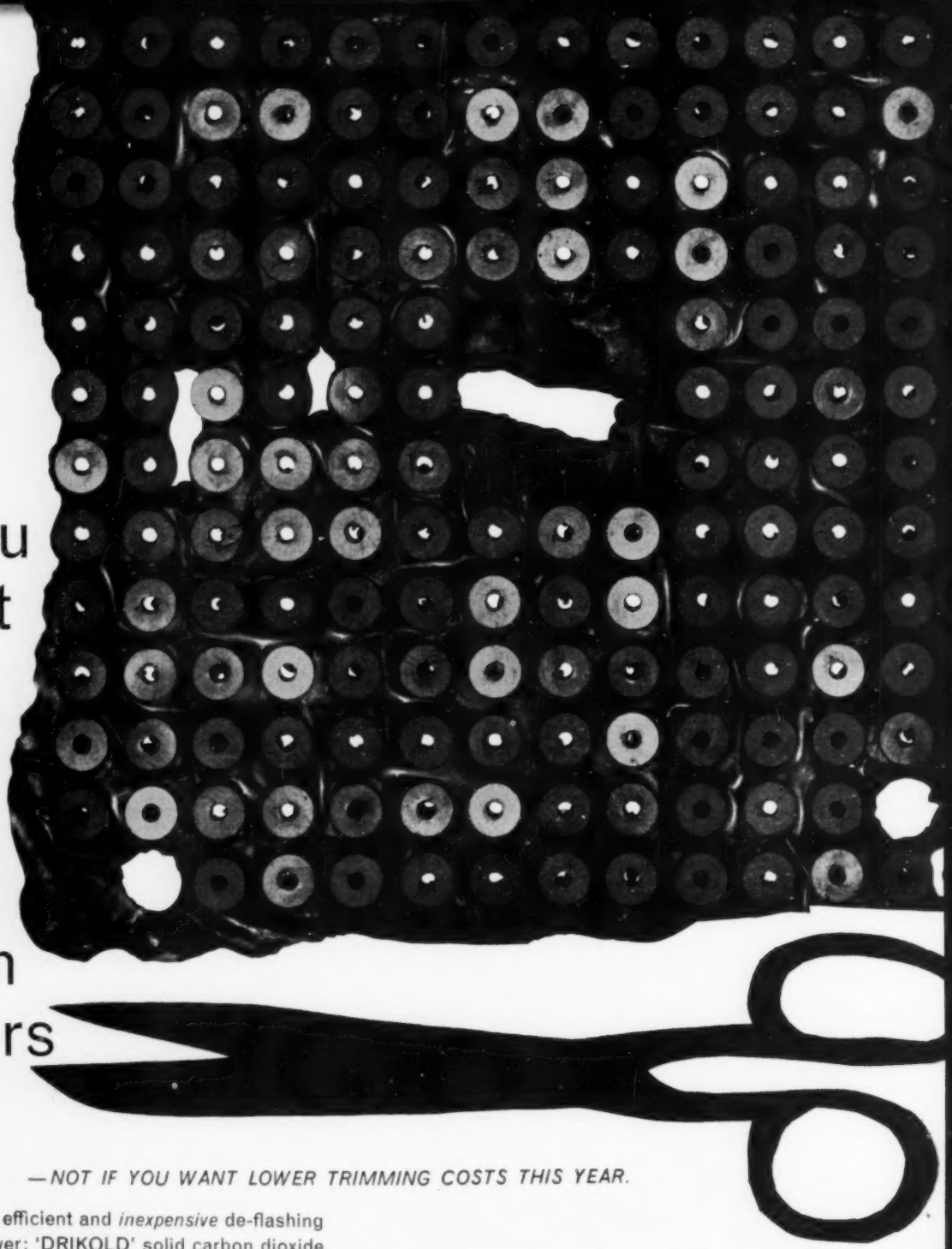
Published by

PALMERTON PUBLISHING COMPANY, INC.

101 West 31st Street · New York 1 · N.Y. · U.S.A.

INDUSTRIAL
COTTON & SYNTHETIC
FABRICS

TANNER BROS.. LTD.
GREENFIELD, NEAR OLDHAM



you can't run round this lot with scissors

—NOT IF YOU WANT LOWER TRIMMING COSTS THIS YEAR.

For really quick, efficient and *inexpensive* de-flashing there's only one answer: 'DRIKOLD' solid carbon dioxide used with the Columbian International sub-zero tumbler. 'DRIKOLD' freezes rubber mouldings so that the flashes become brittle and break off as the drum of the tumbler rotates. Many small mouldings—even complicated ones—can be de-flashed in this way. Why not ask us to de-flash a sample batch for you? Just fill in the coupon and we'll arrange the rest.

IMPERIAL CHEMICAL INDUSTRIES LTD.,
LONDON, S.W.1.

ICI

To: IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.1

Please arrange to de-flash a sample batch of mouldings ☐
Please send me your literature on de-flashing with 'Drikold' ☐
I should like further information about the Columbian International sub-zero tumbler ☐

Tick as required

NAME .....

ORGANIZATION .....

ADDRESS .....

.....

DK342

Editorial Director: J. D. COPEMAN

Editor: PETER RANSLEY

Technical Editor: RICHARD NYE, MA

Consultant Editor: W. S. PENN, BSc

Advertisement Manager: MICHAEL J. WHELAN

UK Area Representatives

L. Quy, South and West of England and South Wales (Operating from London Office)

A. J. Legg, Area Manager, 55 Lee Lane West, Horsforth, Nr. Leeds. Tel. No. Horsforth 3845. North-East England, Lancashire, Yorkshire and Lincolnshire

E. R. Leaver, Group Advertising Manager, Scotland (Operating from London Office)

W. Brown, Area Manager, 13 Allerton Road, Southport, Lancashire. Tel. No. Southport 5121. Cheshire, Cumberland, Westmorland

E. Burgess, 40 Parkside Drive, Maybank, Newcastle-under-Lyme. Tel. No. 64678, Staffordshire North of the A.5

W. J. Bird, 2 Christopher Road, Quinton, Birmingham, 32. Tel. Woodgate 5804. Derbyshire, Shropshire, South Staffs., Leicestershire, Nottinghamshire, Warwickshire, Worcestershire and N. Wales

Overseas Representatives

Belgium—Albert Milhado & Co., GmbH, Pompstraat 2, Antwerp

France—John Gentry, 150 Boulevard Magenta, Paris X

Germany—Albert Milhado & Co., GmbH, Charlottenstrasse 32, Dusseldorf. Tel. No. 27217

Italy—Massimo Fano, Via V. Monti 14, Milan. Tel. No. Milan 808135

Netherlands—G. Arnold Teesing, Rubensstraat 68, Amsterdam, Z. Tel. No. 727913

United States—Overseas Publishers' Representatives, 29 West 34th Street, New York 1, N.Y. Tel. No. Bryant 9-0794

RUBBER and PLASTICS WEEKLY

Formerly 'Rubber Journal and International Plastics'

Volume 141 IN ITS 78th YEAR No. 26

December 23 1961

Editorial

NOTES OF THE WEEK 1009

Articles and News

NEWS BRIEFS 1010
THE BIG MERGER 1012
BERSTORFF CALENDER FOR USA 1013
PHYSICAL TESTING OF FOAMS—2 1014
PI NEWS 1016
RMEA SAFETY STUDY CONFERENCE 1017
LABORATORY MILL SAFETY GUARD 1025
PLASTICS MACHINERY DEVELOPMENTS 1027

Features

VIEWS AND REVIEWS 1020
MEN AND MATTERS 1022
THE LEGAL ANGLE 1024
BOOK REVIEW 1026
RUBBER STATISTICS 1028
RUBBER AND PLASTICS STOCK MARKETS 1029
INDUSTRY INTELLIGENCE 1030
EXPORT OPPORTUNITIES 1031
BRITISH STANDARDS 1031
CROSSWORD 1031
TRADE MARKS 1033

Classified Advertisements . . . 1034 Advertisers Index . . . 1036

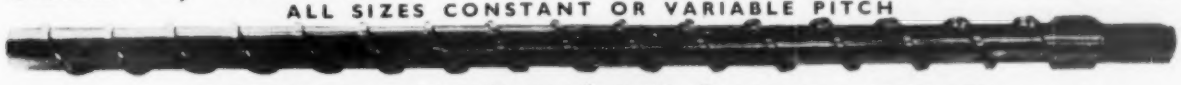
MACLAREN HOUSE, 131 GREAT SUFFOLK STREET, LONDON, S.E.1

Grams: 'Buns, Souphone, London' Phone: HOP 5712

Annual Subscription, including Postage: United Kingdom and Oversea, £2 15s.; Index (half-yearly), 10s. per annum extra. Published weekly. Registered at GPO as a Newspaper. Registered for Transmission by Canadian Magazine Post. Entered as Second Class matter at Post Office, Boston, Mass. USA, under the Act of March 3 1879 (Sec. 397 P. L. and R.)

SCREWS, BARRELS & LINERS FOR PLASTIC EXTRUDERS

ALL SIZES CONSTANT OR VARIABLE PITCH



Also manufacturers of

SPIRAL MARKING MACHINES

FOR PLASTIC CABLE IDENTIFICATION

BUNCHING & TWINNING MACHINES
STRANDING MACHINES

PAPER LAPPING MACHINES
PAY OFF & TAKE UP STANDS

JOHN DOCKER & CO. (ENGINEERS) LTD.

CROMWELL WORKS, NORTH FELTHAM TRADING ESTATE, FELTHAM, MIDDLESEX. TEL: FELTHAM 6341
GRAMS: DOCREBUILT, FELTHAM
CABLES: DOCREBUILT, LONDON

There is a **BRIDGE FARREL** 'capacity matched'

EXTRUDER for all sizes of BRIDGE-BANBURY MIXER on all types of process . . .

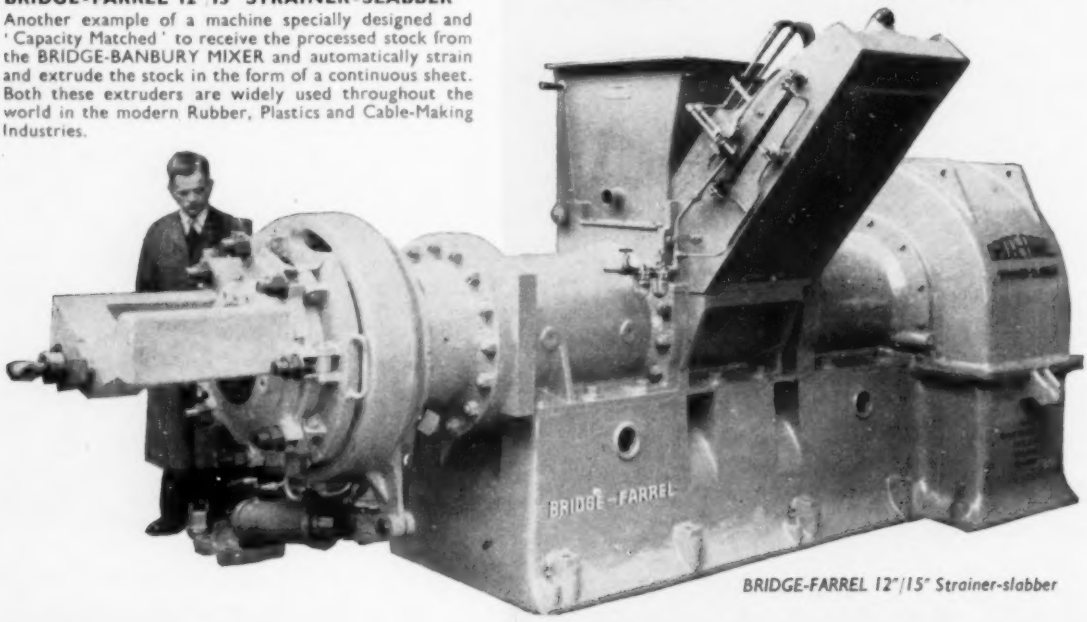
BRIDGE-FARREL 15"/18" Pelletiser

BRIDGE-FARREL 15" 18" PELLETISER

This extruder is specially designed to automatically receive the processed stock from the BRIDGE-BANBURY MIXER and continuously transform the bulky, hard-to-handle masses into small, free-flowing, easy to store pellets.

BRIDGE-FARREL 12" 15" STRAINER-SLABBER

Another example of a machine specially designed and 'Capacity Matched' to receive the processed stock from the BRIDGE-BANBURY MIXER and automatically strain and extrude the stock in the form of a continuous sheet. Both these extruders are widely used throughout the world in the modern Rubber, Plastics and Cable-Making Industries.



BRIDGE-FARREL 12"/15" Strainer-slabber

BRIDGE FARREL **"matched capacity" units are world acclaimed as the ultimate in continuous, high-production automated processes**

DAVID BRIDGE & COMPANY LTD. CASTLETON, ROCHDALE, LANCASHIRE

Telephone: Castleton Rochdale 57216 · Telegrams: Coupling Phone Castleton, Lancs.

London Office: Broughton House, 6, 7, 8, Sackville Street, Piccadilly, W.1

Telephone: Regent 7480 · Telegrams and Cables: Ederaceo, London, W.1

Technically associated with the FARREL-BIRMINGHAM CO. INC., U.S.A. for over 40 years on the BANBURY MIXER and special machines

NOTES of the WEEK

Pauses and Breaches

THE Chancellor's wage pause has become a matter of semantics in a number of industries. Undertakings made before the pause began to re-examine wage structures have been regarded by some firms as 'moral commitments', and have therefore been turned into fresh agreements, breaching Mr Lloyd's pause. Something of this kind has led to the current wage unrest in the heavy chemical industry, which includes, in this context, plastics raw materials. Earlier this month three of the major oil companies granted wage increases of 3-4d. an hour to more than 6,500 refinery workers. This has put companies controlling petrochemical plants adjacent to these refineries in a difficult position. Union representatives at these plants are naturally using the refinery increases as an argument for a rise in their workers' wages. But the employers are tied to the recent decision of the Association of Chemical and Allied Employers, which rejected a claim for substantial increases for 60,000 workers. As *RPW* went to press, preparations were taking place for a discussion of this rejected claim by the Chemical and Allied Joint Industrial Council.

This case is just one illustration of the inconsistencies that have arisen from the Government's pay pause policy. While the argument that a firm line must be taken over wages to curb inflationary pressure is a strong one, the way in which the pause has been instituted is a bad one that is giving bad results. When one worker's pay packet is 'frozen', and another's at a plant half-a-mile away is not, then there are negotiational headaches in plenty — and not all on one side of the fence.

Automate

AUTOMATION is assumed to be the concern of the larger firms. The small manufacturer frequently will not consider it, because, he argues, he has short production runs, limited space and capital, no specialist personnel. . . . But, so far as low-cost automation is concerned, the advantages are not all on the side of the big man. The small firm is likely to be much more flexible, having less rigid product designs for example, and to be in a position to make a quicker and proportionally less expensive change-over.

With the possible entry of the UK into the Common Market by 1963, small firms in both the rubber and plastics industries would do well to examine now the possibilities of automation, which could put them into a better position in the highly competitive marketing conditions ahead.

A feature of low-cost automation is that it uses essentially simple types of equipment, such as air cylinders, solenoids, valve timers and photo-electric cells. These can be built into existing plant and machinery, such as machine tools, guillotines, bending machines and mixers. Other applications may require no more than a simple frame or the use of an indexing unit on which the equipment is mounted. Because of this versatility, low-cost automation can be profitably applied to batch production, and the construction of the equipment is usually well within the ability of a competent maintenance department. The hardest step to take is the first. But it costs nothing or very little to take it: to examine the possibilities on paper; and the return could be considerable.

Automation is not merely the concern of individual firms. We need a central body to deal with its wider implications. As Landon Goodman, an industrial specialist of the Electrical Development Association has said: 'The sooner a Department of Automation is established in this country the better. Industrial experience has always shown that unless somebody is given the responsibility for the development of a science or technology, progress very nearly marks time'. If such a department did only two things — disseminated unbiased information and dealt with personnel problems arising — its existence would be more than justified.

Leave Him Alone

WE found this advice for export managers in the austere pages of last week's Board of Trade Journal. 'Once you have appointed an agent leave him entirely alone. If he can sell a bit without any trouble to himself and you he will. If he does not, do not pester him with inquiries or pep talk. Remember the less he sells the smaller the commission you have to pay. Many West German firms must be approaching ruin through paying generous commissions, financing stocks and prior deposits, sending technical staff for extended visits, providing publicity and advertising material, etc.'. Perhaps we ought to add that the article was called 'How not to export . . . '.

Christmas Greetings
to all our Readers

NEWS *Briefs*

ALLIED TO MAKE PLASTICS FILMS—POLYMER'S BUTYL PLANT?—GULF OIL IN HOLLAND—VINYL FILM PRICE UP — BASF JAPANESE SUBSIDIARY

●**Greece** — Pirelli-Hellas, the Greek subsidiary of the Italian tyre manufacturer Pirelli Spa of Milan, is doubling its capitalization from 3.6 to $7m. as a prelude to expanding its facilities. The firm has a tyre plant at Patras near Athens. The Greek Ministry of Co-ordination has approved the increase, and the company now plans to produce enough tyres to cover domestic demand and to leave a surplus for export.

●**West Germany** — Badische Anilin (BASF) chemical concern in partnership with Mitsubishi is to build a petrochemicals plant in Japan at Yokkaichi, near Nagoya. The plant is to start production in 1963 with an initial capacity of 3,000 tons of Styropor polystyrene. For the purposes of this venture BASF and Mitsubishi have founded a joint subsidiary, Yuka-Badische KK.

●**United States** — Arrangements to acquire a plant site near Pottsville, Pennsylvania, for its first commercial facility to produce plastics films has been announced by Allied Chemical. The initial products to be produced at the new site will be Aclar fluorohalocarbon and Capran polyamide films, both currently in pilot plant production. They are expected to be made available next year to world markets.

●**Belgium** — Polymer Corporation, the Canadian State-owned synthetic rubber producer, is to invest $20m. in a new producing unit at Zwijndrecht, near Antwerp. Refinery gases will be brought from the Kruisschans refineries by a pipeline in the bed of the river. This is reported to be the butyl rubber plant, plans for which were delayed by difficulties arising from the patent situation (*RPW*, November 25, 858).

●**India** — Tyres for the Boeing 707 aircraft are being manufactured for the first time in India at the new aero tyre plant of the Dunlop factory at Sahaganj which started production recently. See Men and Matters page 1023.

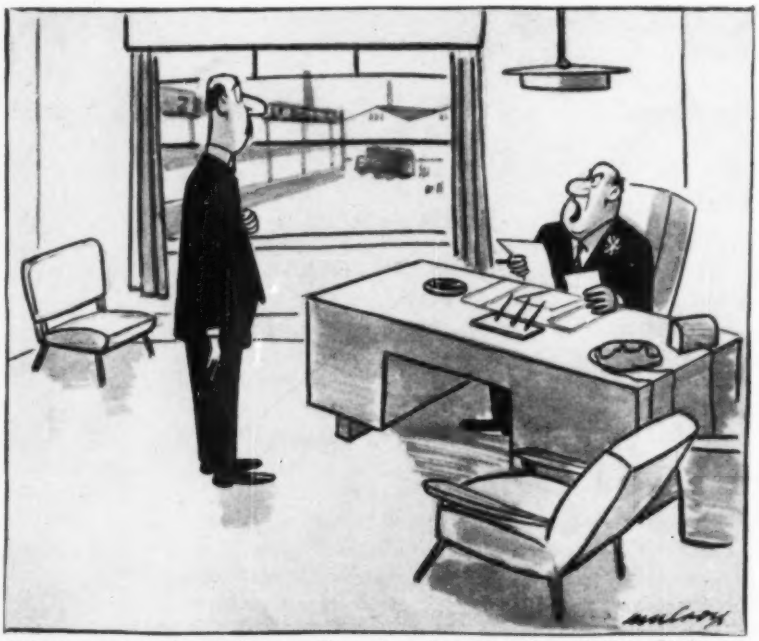
●**United States** — The Pantasote Co. is to increase prices of its vinyl films by approximately 4%, with effect from January 1. This marked the first price increase in the vinyl plastics field in more than three years, according to the vice-president of Pantasote, Mr Sylvester Maloney. He acknowledged that Pantasote would thus be reversing a long-term trend, during which prices of both raw material (polyvinyl resins) and films had been sinking steadily under competitive pressures, but he said that it was 'economic nonsense' for vinyl prices to have sunk to so low in recent months, when the trend of manufacturing costs had been upwards.

●**Holland** — Plans to build an oil refinery at the Europort site in Rotterdam have been announced by Gulf Oil. This will be the company's second refinery in Europe as it has an installation under construction at Stignaes, Denmark. The cost of the new project will be £15m. and 1.5m. tons of crude will be processed annually. The usual range of petroleum products will be made, according to a statement made recently by C. D. Read, vice-president of Gulf-Eastern Co. Ltd., and dock facilities for discharging crude from super tankers and for loading refined products and LPG will be provided.

●**Mexico** — Three production units are to be built in Mexico by Mexicmont SA. A 5m. peso plant for the production of polyester glass sheeting is due to open in mid-1962 and the other two plants will produce plastics foils and synthetic fibres. Technical aid will be provided by Montecatini, who will also supply patent licences.

●**United States** — The Firestone Tyre and Rubber Co., Akron, Ohio, has announced a new simplified dealer pricing policy and list price reductions on the popular types of passenger car tyres, most farm tyres, all truck tyres except certain off the highway types, and all tubes effective January 1 1962. The reductions range from 4.1 to 33.1%.

●**India** — United Carbon Co., of Houston, Texas, has received Indian government approval of a licence for it to form a company which will build and operate a carbon black plant near Bombay, India. United Carbon will be a substantial equity owner in the new company, but majority interest will be controlled by Indian nationals. Initial rated capacity for this new plant will be at least 30m. lb. a year. Two other US carbon black companies have also been issued licences and are now building plants in India.



'I don't want to disillusion you Penpatter, but next time Father Christmas orders and collects four gross of golf balls—slap him with a 'pro forma''—568

DIXIE 45 is a general purpose, low cost furnace black now manufactured in the U.K. Possessing an unusual combination of the high modulus of HMF blacks; the high resilience, low hysteresis and low heat build up of SRF blacks; the smooth extrusion characteristics and low die swell of oil based blacks.

DIXIE 60 (HAF Black) processes easily and gives high resistance to abrasion and flex-cracking. Dixie 60 is now manufactured in the U.K. to the same high standard of uniformity and quality maintained by its American counterpart over many year.

DIXIE 70 (ISAF Black) is the latest addition to the range of Dixie Blacks now being manufactured in the U.K. Ideal for toughest treads, maximum mileage tyres and for gruelling high speed highway operations.

BRITISH MADE CARBON BLACKS

ANCHOR CHEMICAL COMPANY LTD · MANCHESTER 11

London Office: Grand Buildings, Trafalgar Square, W.C.2.
Scottish Agents: J. & G. Hardie & Co. Ltd., 178 Fulton Street, Glasgow, W.3
American Liaison and Service Branch: British Anchor Chemical Corporation, 366 Madison Avenue, New York 17, N.Y.

The Big Merger

MAN-MADE FIBRES CENTRAL TO I.C.I./COURTAULDS TALKS

THE proposed merger between Imperial Chemical Industries Ltd. and Courtaulds Ltd. would not have much effect on the activities of both companies outside the man-made fibre field. So far as plastics are concerned, any reorganization might take place only in the packaging film side.

I.C.I. announced details of the merger talks on Monday (December 18), at a press conference given by I.C.I. chairman, S. P. Chambers. The conference was arranged in a few hours after a leak had given rise to a number of rumours.

A statement from I.C.I. says that 'friendly discussions' have been proceeding for four months with the directors of Courtaulds upon a merger of the businesses of the two companies.

Stockholders' Approval

The statement continues: 'The directors of I.C.I. unanimously believe that such a merger is in the interests of the two bodies of stockholders and of the country, and they have informed the board of Courtaulds of their intention to offer to the stockholders of Courtaulds to acquire the whole of the ordinary and preference stock of that company in exchange for ordinary and preference stock respectively of I.C.I. This offer, which is subject to I.C.I. stockholders' approval of the necessary increase in capital, will be as follows:

For every £4 ordinary stock of Courtaulds, £3 ordinary stock of I.C.I., and for every £1 of 5% preference stock of Courtaulds, £1 of 5% preference stock of I.C.I. and for every £5 of 6% preference stock in Courtaulds £6 of 5% preference stock in I.C.I.'

Dividend Forecast

All stockholders would be entitled to dividends declared, or to be declared, by Courtaulds for the year ending March 31 1962, and also to all dividends to be declared by I.C.I. for the year 1962. I.C.I. board expects to declare the same total ordinary dividend for 1961 as for 1960 (13¼%), and not less than this for 1962. I.C.I. board estimates that the total Courtaulds ordinary dividend for the year is likely to be about 10% or a little less, but full information to make accurate forecasts rests with the Courtaulds board.

Owing to the printing and other work involved it will be between four and six weeks before the offer can be transmitted to the stockholders of Courtaulds.

The directors of I.C.I. have not yet heard whether the directors of Courtaulds will recommend this offer to their stockholders.

Mr Chambers said that, as the chairman of Courtaulds, Sir Hambury Williams, was abroad, the offer had been transmitted to the deputy chairman, Sir Alan Wilson. An answer was not expected until after Christmas.

High Growth Rate

Dealing with the reasons for the merger the I.C.I. chairman said that the man-made fibre industry had an exceptionally high growth rate — 10-12% compound per annum — a very high growth rate for any industry. This country ought to be in the forefront of the field.

But the duplication of effort by I.C.I., Courtaulds and its joint company, British Nylon Spinners, compared unfavourably with conditions in America and continental Europe where there were fully integrated producers covering the whole range of man-made fibres (Du Pont and Rhone-Poulenc).

Mr Chambers said that there would be great advantages in integration. Considerable savings could be effected in current operations (both manufacture and marketing) in both research and development, and in capital expenditure. For example, he said, similar types of research took place at BNS on nylon and on terylene in the I.C.I. Fibres Division.

Not a Monopoly

Referring to the size of the combined companies, Mr Chambers said that he believed that the UK would enter the Common Market. They would not be in a monopoly position then; they would be a first-class industry fighting in a highly competitive market.

He stressed that the merged undertaking could give powerful assistance to the British textiles industry.

A very substantial reorganization would have to take place, declared Mr Chambers: but he spoke of this in terms of redeployment rather than redundancy. Natural wastage and expansion would together reduce the likelihood of redundancy. Courtaulds would continue to exist as a separate entity, and its rayon factories would be unaffected. The nylon side would be reorganized but there was no question of shutting down any plants. (Courtaulds announced plans in June this year to build a plant to make 20m.-25m. lb. of Nylon 6, using the Caprolactam process. At the same time I.C.I. stated that it had concluded a patent agreement on the Nylon 6 process with Emser Werke AG of Switzerland, and would produce the material at Severnside.)

Wide Range of Products

If the merger takes place, it will result in a £1,045m. company having a total labour force of over 140,000, which will produce 90-95% of UK man-made fibres.

Besides the enormous range of plastics produced by I.C.I.'s Plastics Division, the new group would contain the products of the Courtaulds subsidiary, British Celanese. This is a leading manufacturer of acetate plastics, and it also produces polypropylene, high density polythene and high impact polystyrene in sheet form.

Recently Courtaulds linked with the US concern Koppers, buying 4% of its common stock (*RPW* July 1, 6). Koppers' main plastics products are polystyrene, low density and high density polythene, and expanded polystyrene.

Trident Parts

Rubber and metallic pipelines, natural and synthetic rubber seals and mouldings, manufactured by Palmer Aero Products Ltd., a subsidiary of BTR Industries Ltd., are featured on the new de Havilland Trident jet airliner ordered by British European Airways for short/medium range flights.

Fluoroflex ptfe hoses have been specified for the pressure, return and drain lines and are incorporated on hydraulic systems used for power-assisted flying controls, undercarriage, wheel brakes and spoilers.

Seals and mouldings are used for pipe clamps, clamp blocks, bearing pads and window seals.

Berstorff Calender for USA

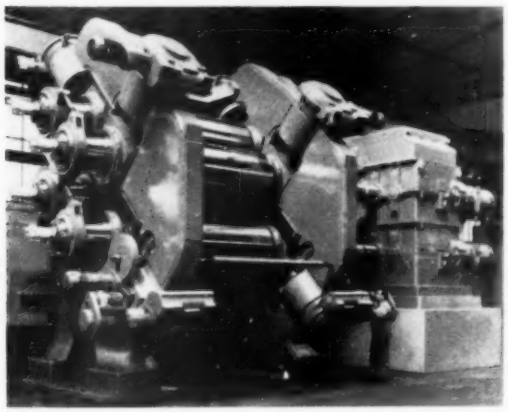
BIGGEST EVER FROM EUROPE?

A CALENDER, believed to be the largest ever built in Europe, has recently been completed for an American customer by Hermann Berstorff Maschinenbau - Anstalt GmbH of Hanover.

The calender, which is intended for the production of thin plasticized pvc film, is of the S or inclined Z type and has a separate gear stand with four separate DC motors. These give infinitely variable speed control and make it possible to adjust the relative speeds of the rolls from no friction to a maximum ratio of 1.5 : 1, which may be entirely on one nip or distributed over all three nips.

Roll bending gear is fitted between the third and fourth rolls, operated by means of a hydraulic cylinder acting on outrigger roller bearings. A similar arrangement acts as a 'pull-back' or pre-loading system between the first and second rolls and the fourth roll can be skewed for axis crossing by means of motor actuated wedges. The screw-downs are driven by separate electric motors on each side and the fourth roll has additional auxiliary screw-down motors giving a very low speed for automatic gauge control.

The total weight of the machine is 317 tons and the rolls are 96in. wide and 36in. in diameter. The speed range is variable from 10 to 100 yd./min. in first gear and from 5 to 50 yd./min in second gear.



This Berstorff calender, built in Germany for an American firm, is believed to be the largest ever built in Europe

Suspensions for Sweden

Dunlop Coventry have received a further order for their Pneuride air suspensions for buses, from Scania-Vabis of Sodertalje, Sweden. This is the second large contract for Dunlop from this company this year.

The Swedish company use air suspension to give maximum comfort to passengers and to keep the platform-step at a constant level. Also, less vibration and shock is transmitted from the road surface to the chassis, resulting in reduced maintenance and longer life for the whole bus.

Dunlop air suspensions are being used similarly on buses running in Belgium, Finland, Jamaica, Holland, Norway, Denmark and Australia.

Arcon Group's New Member

Turner and Newall is to join the Arcon Group which, formed in 1943 to carry out research and development into building techniques and the use of new materials, now produces factory made structures for all types of construction and exports around 80% of group production.

The group, from January 1 1962 will consist of Henry Hope and Sons, I.C.I., Stewarts and Lloyds, Taylor Woodrow (Building Exports), Turner and Newall and the United Steel Companies. A. M. Gear and Associates is group consultant.

Wage Pact Ends

The National Union of Plantation Workers has given the Malayan Planting Industries Employers' Association one month's notice terminating its wage agreement which came into operation on June 1 1959. The union represents 300,000 Malayan estate workers.

Fibres Congress

The Queen Mother will perform the opening ceremony at the Royal Albert Hall on May 1 1962 of the Second World Congress of Man-made Fibres. Over 3,000 delegates are expected to attend.

MB Starts Packaging Production in Ireland

MORE details are now available of the new plastics enterprise in Ireland which, as previously announced, has been started as a joint venture by The Metal Box Co. Ltd. and The Irish Glass Bottle Co. Ltd.

A new company has been incorporated in Ireland, under the name Irish Plastic Packaging Ltd. The company has an issued capital of £201,000, and the first directors are J. McGrath (chairman), J. Griffin, Dr F. M. Carey, P. McGrath, D. Ducat, D. J. Liston and J. M. Jackson.

Mr Griffin is managing director of The Irish Glass Bottle Co. Ltd., and Mr Ducat is managing director of The Metal Box Co. Ltd.

Dr Carey of The Irish Glass Bottle Co. Ltd., has been nominated general manager of the new company.

A five acre site has been acquired for a factory at Ballyfermot, Dublin, and production has already started at temporary premises nearby. The operations of the new company will cover a wide range of plastics packaging, including bottles, film, injection mouldings, and laminations.

The new company will draw on the technical know-how of the Plastics Group of The Metal Box Co. Ltd., and the sales will be conducted from the Irish Sales Office of The Metal Box Co. in Dublin, under the management of C. W. T. Morshead.

Screw Seal

A new sealing material for screw threads is being made by Richard Klinger, Klingerit Works, Sidcup, Kent. The name is Klingerflon and it consists of either a thin ribbon or a string of ptfe. This synthetic material is fairly soft, yet has a very low coefficient of friction. It is finding more and more applications, especially for frictionless bearings and dry lubrication. The ribbon or string is wrapped round the thread of, for example, a pipe, and when this is screwed home the ptfe is soft enough to take up the contours of the thread without jamming it.

Maintenance Engineering

An International Plant and Maintenance Engineering Conference and Exhibition is being organized to take place at the Alexandra Palace, London, from June 17-21 1963.

Physical Testing of Foams — 2

MECHANICAL AND ELECTRICAL PROPERTIES

THE first part of this survey on the physical properties and methods of testing foams, published last week (*RPW* December 16, 976) dealt with general and thermal properties. This concluding part is devoted to the mechanical and electrical properties.

Increasing interest is now being shown in low-density plastics materials for load-bearing applications in sandwich constructions. The mechanical properties are therefore of prime importance and many tests are available to test the foams suitably.

Tensile Strength

This property does not command a great deal of interest for foams being considered as load-bearing members. Properties exhibited in compression and flexure are of greater importance.

The stress-strain curve of nearly any plastics material can be represented by a curve taking the general form shown in Fig. 1.

The slope of the curve, where stress and strain are more or less proportional is a measure of the stiffness of rigidity. The ratio of stress to strain ($\delta y/\delta x$) in this section is known as the Modulus of Elasticity (also referred to as Young's Modulus). (See Fig. 1.)

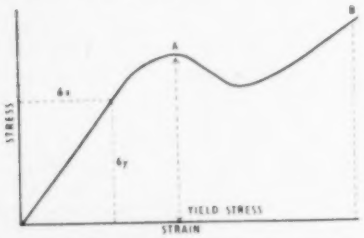


Fig. 1. Stress/strain of a typical plastics material

The stress at the point 'A' which is known as the 'yield point' may be taken as a measure of the strength of the material and of its resistance to permanent deformation. Up to point 'A' the strain is largely recoverable and is a measure of the elastic deformation. Proceeding beyond 'A' to 'B' the strain is not generally recoverable and is a measure of plastics deformation.

Tensile strength is to a large extent dependant upon the density of the material and a property of more significance would be specific strength as is defined as follows: Specific strength = tensile strength/density.

The dimensions of this property are, of course, length, and may be expressed in feet. The higher the value the better are the foam's strength characteristics. The tear strength is normally used for flexible foams and the method will now be described.

Tear Strength

This property may be measured for flexible foams and bears significance as to the strength suitability of foams. A method for the measurement of this property is given in an article published by The Plastics Institute (February 1959), by J. M. Buist and A. Lowe. The method describes tear strength for flexible foams under particular conditions and is therefore only useful for comparison and does not necessarily simulate service performance.

The method is as follows: A specimen, dimensions 1in. sq. in cross-section and 3in. long is cut from a block of foam. A cut 1in. deep is made from one end toward the centre of the specimen. The two sections of the foam made by the cut are placed in the jaws of an extensometer, which are then pulled apart at a rate of 20-22in. per min. and the maximum steady load to effect rupture is recorded. The results may be expressed as lb. per in. of tearing strength or kg./cm. of tearing length. The mean value from five samples is usually taken. The tear strength for flexible polyurethane is approximately 0.5-1.0kg./cm.^{2}

Flexural Strength

This property is sometimes referred to as cross-breaking strength or modulus of rupture and represents the maximum stress developed in the surface of a specimen of known dimensions when it is supported near its ends and loaded in a central position until failure occurs. The normal units of measurement are lb. per sq. in. and there are two methods normally used to measure this property.

(i) Cantilever Test

The specimen is held by a clamp at one end and the load applied at a given distance from the near edge of the clamp. This is the method normally specified for expanded ebonite. (BS 903.)

(ii) Three-point Loading Test

The specimen of known dimensions is supported at two points, a given distance apart, and the load is applied midway between them. This is the method normally applied to measuring the flexural strength of low-density polymers and it is anticipated that this method will be included in future BSI specifications on rigid foams.

The flexural strength may be calculated as: $3Ld/wt^2$, where L = breaking load, d = distance between supports, w = width of specimen, t = thickness.

The value of this property is also related to both density and surface finish of specimens. Errors will be obtained if the sample has a hard surface skin obtained during the moulding process and specimens should therefore be 'skimmed' to standard dimensions.

Compressive Strength

This property is sometimes referred to as crushing strength and is the maximum stress that a rigid material will withstand under longitudinal compression. This is a measurement of force per unit area and the units are normally lb. per sq. in.

Compressive strength measurements are only suitable for rigid foams and the test normally used for evaluating flexible foam is a compression set test.

An interesting distinction between two classes of rigid low-density foams is given in DIN 7726. This is graphically represented in Fig. 2 (a) and (b), showing stress strain curves for flexible hard foams and rigid hard foams respectively.

The flexible hard types such as foamed pvc and polystyrene have slow and only partially recoverable deformation under sufficiently high compressive stress. The rigid hard materials, *e.g.* foamed rigid polyurethane, are easily recognizable by the crushing they undergo when they pass point 'A'. Therefore, in the case of the flexible hard materials a yield estimation has to be carried out by drawing tangents to the Hookian part of the curve and the shallow portion

X at the intersection of these points the value of the yield is given.

A suggested method of measurement would be as follows: a sample in the shape of a cube of known dimensions is placed between two flat anvils (parallel) and compressed in a machine at a standard rate. The compressive yield strength is the load at which the initial straight portion of the load compression departs from linearity divided by the original cross-sectional area of the specimen.

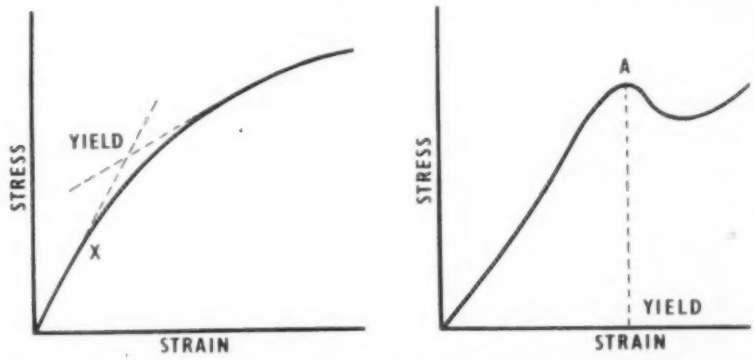


Fig. 2. Typical stress strain curves for (*left*) **flexible hard foam material and** (*right*) **rigid hard foam**

Compression Set

This property is important in connexion with flexible foams such as rubber latex and polyurethanes. This property is the residual strain in a flexible specimen after it has been strained under compression to a given extent for a given time, and then allowed to recover for a given time, the temperature being substantially constant during the test.

A method is given in BS 903, Part F6: 1956 for the measurement of this property and is intended to measure the relative ability of various foamed materials to retain their elastic properties after the prolonged application of compressive strains. The apparatus consists of two or more flat steel plates between the parallel faces of which the test piece is compressed. Steel spacers in the form of bars and of thickness such as to give the required percentage compression shall be provided to control the thickness of the test-piece during the test. The compression set is the difference between the original thickness of the test-piece and that after recovery expressed as a percentage of the initial compression. If t_0 is the original thickness of the test-piece, t_r is the thickness after recovery, and t_s is the thickness of the spacer, then the compression set at constant strain = $100\ (t_0-t_r)/(t_0-t_s)$.

A graphical representation of the comparison between the compression and deflection curves of various flexible foams is given in Fig. 3. An ASTM method is also available and this is carried out at 70°C. (50% compression for 22hr. followed by 30min. at RT beforé re-measurement), but the British Standard procedure is the preferred method in this country.

Impact Strength

This is a measurement of the resistance of a material to sudden application of a mechanical load and is a measure of the work done in breaking a test-piece. This property is essentially a measurement of toughness and the units are normally expressed in ft./lb. per in. of notch.

There are two basic test machines: (a) Simple Beam (Charpy), (b) Cantilever Beam (Izod).

Many variable test results are given in literature for the impact strength of rigid foams and are open to some comment. Due to their cellular structure there is the difficulty of obtaining a reproducible notch. The cutting of a notch will be very difficult with such materials and it would be virtually impossible to determine the number of cells that the 'notching' machine would cut. A falling weight method, if used universally, would give results more suitable for correlation.

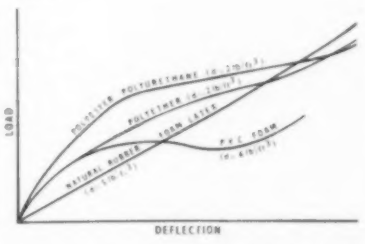


Fig. 3. Load deflection curves of a number of foamed plastics and rubbers

Resilience

The significance of this test is high for assessing the suitability of a foam for packaging purposes. This property may generally be regarded as ratio of the energy given up on recovery from deformation to the energy required to produce the deformation. A certain amount of the energy used in the deformation is dissipated as heat and thus is not available as elastic energy during recovery. Owing to the wide variety of possible service conditions, no general correlation between the rebound resilience and the energy dissipated as heat during service conditions can be given, but rebound resilience determined in a standard instrument gives results suitable for comparisons to be made and thus provides a basis for selection as to the suitability for specific applications.

This property is normally measured by determining the rebound of a pendulum or ball after single impact. Three general methods of measurement are quoted in BS 903, Part 22: 1950 and are: (1) the Dunlop pendulum method, (2) the Lüpke pendulum method, (3) the Dunlop tripsometer. Details of the methods used for calculating the rebound resilience are given in Section 22.5.

It has been reported that a method used by the Ministry of Supply utilizes the maximum deflection of the specimen under test resulting from an impact velocity produced by a free fall. It is considered that to obtain a material suitable for packing purposes, the graph of energy absorbed plotted against deflection should be as near to a straight line as possible. Low-density flexible foams manufactured with a coarse cell structure have a much faster recovery than those with a very fine cell structure, possibly due to the greater ease with which air can enter and leave the foam. The lower resilience and slower recovery is not necessarily a disadvantage for some applications, in particular in the packaging field.

Foamed polystyrene and rigid polyurethanes are showing promise as packaging materials and this application will probably develop quickly in the near future.

Electrical Properties

The use of plastics foams for electrical application cannot be considered large, although some use is made in potting and radar work. Foamed epoxy materials as well as the polyurethanes are demanding increasing interest for such applications. Little or no use at all is made of the open-cell type and it has been found in practice that many of the electrical properties are dependent upon density. The high water absorption of the open-cell types seriously limits their use. It is possible to cal-

culate some of the electrical properties of the foam from data obtained on solid polymers. The dielectric constant (permittivity) is, of course, the ratio of the capacity of a condenser having a foam as the dielectric compared with the same condenser having air as the dielectric. Many of these foams contain over 90% of air and as expected measurements will nearly always approach that of air and thus the dielectric constant value for most foams is in the region of unity.

Conclusion

Many industries are now fully aware of the relative merits of the low-density polymers. The increased consumption of these materials has made it imperative that a specification be devised by some recognized authority in this country to cover all aspects of quality of both rigid and flexible foams. There is hope that the British Standards Institute will issue a specification in the very near future covering the rigid low-density foams.

A specification has been issued just recently to cover an application and is BS 3379:1961. This covers urethane foam for vehicles and is for polyether foam cushioning used for seating, arm rests and backrests in aircraft, trains and road vehicles. A similar specification is being prepared for the furniture industry.

The introduction of the various specifications have been comparatively slow for some testing authorities and private associations have deemed it necessary to compile their own specifications. One such body showing this useful enterprise is the British Cellular Rubber and Plastics Manufacturers, who have issued their own specification for plastics foam.

Undoubtedly, the testing authorities are now fully aware of the requirements and this lack of specifications covering the aspects of production and quality of rigid foams will soon be remedied.

BIBLIOGRAPHY

The Properties and Testing of Plastics Materials, by A. E. Lever and J. Rhys, published by Temple Press, 1957.

The Measurement and Interpretation of Properties of Low-Density Plastics Materials, by G. C. Ives, *Transactions Plastics Institute*, July 1958.

Properties of Cellular Polymers, by A. Cooper, *Ibid.*, July 1958.

BS 903 Parts F1 to F9. Methods of Testing Soft Cellular Rubber.

BS 476 : 1953. Fire Tests on Building Materials and Structures.

DIN 7726. See Kunststoffe 47 (January 1957).

BS 1133. The Packaging Code, Section 7, Appendix E.

BS 903 Part 22 : 1950. Measurement of Resilience.

BS 874 : 1956.

PI NEWS

Polymers to Plastics

SIR Owen Wansborough-Jones will deliver the twelfth annual lecture of the Plastics Institute in Birmingham on Thursday April 12 1962 at 6.30 p.m. Called 'From polymers to plastics', it will be held at the Byng Kendrick lecture theatre at the College of Advanced Technology in Birmingham and the lecture will be open to all.

Accelerated Vocational Training

Dr C. A. Redfarn, chairman of the Education Committee of the Plastics Institute, has been nominated as a UK representative to attend the international seminar on accelerated vocational training in the manufacture of plastics goods to be held in Paris from March 12-14 1962. The seminar is being organized by the European Productivity Agency.

Plastics Industry Education Fund

T. L. Birrell has been elected chairman of the trustees of the Plastics Industry Education Fund from January 1 1962 in place of C. S. Dingley, who will, however, continue to serve as a trustee for the time being.

Training grants to the value of £627 have been made to 13 students taking full-time courses in chemistry and physics at universities and technical colleges.

Design Committee

T. E. H. Gray has been elected chairman of the Design Committee of the Plastics Instiute and D. J. Plumb vice-chairman.

Transactions and Journal

The February 1962 issue of the Transactions and Journal of the Plastics Institute will contain the complete proceedings of the 'Engineering with plastics' conference which was held in London at the end of October. Copies of the conference issue may be reserved by sending a remittance of £1 to the Plastics Institute, 6 Mandeville Place, London W.1.

Plastics in Building

The Building Centre in collaboration with the Plastics Institute has arranged a forum at the Centre, 26 Store Street, London W.C.1, on Wednesday, February 7 1962 from 6.0-7.30 p.m. on 'The future for structural plastics in building'. Dr W. Dawson and Dr Z. S. Makowski will open the discussion.

Neoprene Bearing Pads for Bridges

MORE than 300 of the bridges which span Italy's growing network of motorways (*autostrada*) are now equipped with a Pirelli bearing support pad made of neoprene.

The latest section of the Italian *autostrada* to be completed is the 290 kilometre stretch between Milan and Florence where 40 bridges, using several thousand neoprene bearing pads, have been constructed. This highway is now being extended from Florence to Rome and will involve the laying of more than 2,000 additional bearing pads.

Pirelli employ neoprene bearing pads with metal separators made of galvanized sheet iron. The neoprene pads are adhered to the metal plates, and the pads laid between the vertical support pillars and the upper concrete surface.

Up to four layers of neoprene are used in each pad and the layers are grooved so that they can be wedged into one another to constitute a single block. The metal separators, grooved in the same way as the rubber plates, are interleaved between the neoprene.

Each bearing is capable of taking a static compression strain of approx. 355 to 427psi. Under maximum live load, the bearings can take a compression strain of approx. 711 to 853psi. Since the bearings with their metal separators work in parallel, horizontal movements are reduced to a safe minimum.

Bowthorpe's New Company

Bowthorpe Holdings Ltd. has reached agreement with the Deutsch Co. of Banning, California, to form a jointly-owned company — Hellermann Deutsch Ltd. — in which Bowthorpe will have a 51% interest.

Hellermann Deutsch Ltd. will manufacture and market the extensive range of Deutsch Connectors for Electrical Conductors and other products, and the range of connectors and ancillary equipment at present being produced and marketed by the Connectors Division of Hellermann Ltd.

Detergent Bottles

Fibrenyle Ltd., manufacturers of polythene bottles, jars and containers, has recently entered the detergent bottle field. The bottles generally manufactured are of 14oz. capacity, each fitted with a red urea dispensing cap and silk screen printed.

RMEA SAFETY STUDY CONFERENCE

Management's Responsibility

SAFETY SHOULD BE CONSIDERED AT DESIGN STAGE*

THE responsibility for industrial accident prevention rests squarely and firmly on the shoulders of management. Governing legislation controlling the safety, health and welfare of the worker is directed towards employers, because they are in the strongest position to alter the environment in which their workpeople spend their lives.

Management is the origin of work, and it is they who say how and when workpeople are employed; the law is very specific on this point. Does management fully understand where its responsibility lies in respect to industrial safety? It should receive the same consideration as any other facet in the life of an industrial manager; unless it does it is never going to be successful.

Administration by committee is one of the major diseases of industry today; committees are slow, they stifle initiative and breed red tape; they may be safe, are sometimes right but never brilliant.

The ideal management must appreciate the importance of humane treatment and good conditions for the worker as well as his other responsibilities. Although the government, trade unions and public opinion have important parts to play, management, particularly at the lower levels, can make the greatest contribution to safety. Good industrial relations go a long way towards solving the problem.

Every manager must consider how he can increase his contribution to the prevention of accidents, and to do this he must review the whole problem.

There has been a substantial reduction over the years in both fatal and non-fatal accidents, thanks to the efforts of right thinking employers, but the number is still very substantial. Out of an industrial population of over 7½m., between 650 and 750 are killed each year and over 190,000 are injured seriously enough to stay away over three days. To add to this, the ratio of minor injuries to reportable accidents is around 500 to one. Again the number of near accidents in industry where no one is hurt must run into several millions.

If an examination is made of the Chief Inspector's report for 1960, two facts stand out. Power-driven machinery accounted for 19.3% of the total accidents in industry (in the rubber industry alone it was 20.4%) and the handling of goods has risen to over a quarter of the total. Twenty years ago the machinery figure was around 15% and it is tragic to think that with all the advanced developments, the figure is rising instead of falling — surely this problem should have been tackled at the drawing board stage. The number of accidents due to handling of goods has also risen steadily, in spite of all the improvements to mechanical handling; one would have expected the percentage to have fallen.

Bernard A. Inshaw, one of the lecturers at the RMEA Safety Study Conference

Any organization wishing to reduce accidents should first of all order and design the right type of machinery with a view to eliminating the handling accidents which exist, taking care that eliminating one hazard does not introduce another.

Here are two causation factors which point out that responsibility lies with management, whether in charge of design, production or layout.

The hall-mark of good management is to insist that safety is considered at the design stage, and this will contribute to efficiency. Efficiency and safety go together; one often finds switches out of reach of the operating position, or levers which require the operator to be deformed in reaching them. Aircraft have to be designed from the pilot out; otherwise they will not fly efficiently. The same analogy should apply to industrial plant.

Whatever one has to say about machinery and the handling of goods, it must still be emphasized that the bulk of accidents occur from ordinary, every-day causes. People using hand tools, persons falling, collisions — in every case there is a failure of human judgement somewhere. It is also regrettable that in many cases, from time to time we fail to observe our statutory duty.

That, then, is the picture as it stands. Are we complacent about it? Are we just keeping up with the national average?

Accidents can be prevented if every person employed is safety conscious, if risks are foreseen and precautions taken, but, and this must be emphasized because it is vital, positive action must be taken by every manager and supervisor and through them by those for whom they are responsible.

There must be a dictum laid down at the very top, that accidents will and must be prevented and this must filter down to the person at risk. Accident prevention is part of the normal management function. Management's job is to manage, and unless it does it efficiently and effectively, it has no right to exist. Control and positive action are the prime essentials and must take priority over any reliance on the safety consciousness of individuals.

We have one common objective, the taming of human nature, one must believe in the goodness of human nature; antagonism and lack of co-operation are not natural — they are a reaction — and the blame for them lies squarely on past management. Past managements were bad only in the sense that they and their times have produced a reaction which we today must cure.

Questions

When Mr Inshaw delivered his paper there were several questions on how to develop the status of the safety officer. Mr Inshaw said that it was essential for the safety officer to report — in advice only — to top management. At the same time top

* *Based on a lecture, 'Management Responsibility to Achieve Safe Systems of Work', by B. A. Inshaw, Head of Industrial Safety Bivision, Royal Society for the Prevention of Accidents.*

management would only get what was paid for.

He said that it was not good practice for the duties of a safety officer to be combined with those of either an engineer or a personnel officer. On the other hand some firms with very good safety records had no safety officer designated as such.

Other questions led up to the problem of obtaining co-operation by joint consultation. Mr Inshaw said that this should really be joint discussion, on the shop floor if possible. It was always wise for the safety officer to ask for help in solving a problem, and then to be a good listener was half the battle, he stated. Should an unworkable suggestion come from the shop floor, it was essential that reasons be given as to why it might not work, rather than that it should be rejected out of hand.

Mr Inshaw insisted that managements at all levels must set the example if workers were to become safety conscious. If helmets or eye-protection were needed, then no one from management should ever be seen in a danger area without that protection, in fact, no member of the staff should ever go into the works without safety footwear.

With a frequency of 1.0 there was an even chance that if one took one risk in a year one would meet with an accident. Why did men take that 'even' chance? 'Give them a six-chamber revolver with one bullet and five blanks and ask them to pull the trigger at themselves or even at you. They will not risk it, and yet the odds are 6 to 1 against injury in this case'.

'When planning alterations to a machine to achieve safe or safer conditions remember that it is the operator's machine you are discussing, and that you offend him if you do not ask his views', said Mr Inshaw. 'The art of getting things done is to let *him* have *your* way'.

Mr Inshaw stated that planned maintenance was the best form of safe working. 'Do not forget that in safety work, the foreman is in the middle of the sandwich and needs help and consideration at all times. A safety officer has no direct responsibility and should remember that when he goes into the works, he is going into a "foreman's shop" not just "the works".'

'Safety should come before production. If it does, then there will be more and better production'.

Import Duty on Vinyl Acetate Monomer

The Board of Trade are considering an application for the removal of the import duty on vinyl acetate monomer classified in tariff sub-heading 29.14(IJ).

A statement of the applicant's case will be made available to all firms and organizations with a *bona fide* interest in this material who wish to make representations.

Requests for a statement of the case should be sent to the Board of Trade, Tariff and Import Policy Division, Horse Guards Avenue, London, S.W.1, not later than January 15 1962.

Comments on the application should reach the Board not later than February 5 1962.

Microcell Resin System

Two highly compatible resin systems — one impregnates, the other encapsulates — are now available in the UK from the Electronics Division of Microcell Ltd., a subsidiary of BTR Industries Ltd., under their marketing agreement with Emerson and Cuming, USA.

The impregnant, Eccoseal 1207, is a high-temperature epoxide of low viscosity. The encapsulant is Stycast 1209 — a casting resin which has high thermal stability, and excellent utility as an impregnant and sealant. Together, these two materials are said to be ideal for transformer and coil embedments.

Management Reshuffle at BICC

SIR WILLIAM McFADZEAN is to relinquish the office of managing director of British Insulated Callender's Cables Ltd.

A statement from the company says that 'in view of the great growth in the activities of the BICC Group in recent years, the chairman, Sir William McFadzean, in order to be free to concentrate on overall policy and the national and international aspects of group affairs, is at his own request relinquishing the office of managing director while remaining executive chairman'.

In this capacity Sir William will remain responsible to the board for supreme executive policy and the overall co-ordination of the company and group, but will delegate the executive operation to R. M. Fairfield and W. C. Handley, at present assistant managing directors, who will become joint managing directors.

H. F. Akehurst, at present assistant managing director, will become executive director (export) and W. Fraser, at present a director, will become executive director (overseas companies).

The changes will take place on January 1 1962.

Sir Harry Melville

The Minister for Science, Lord Hailsham, has appointed Sir Harry Melville, KCB, FRS, Secretary of the Department of Scientific and Industrial Research, to be a member of the Research Council.

In making this appointment, Lord Hailsham gives recognition to Sir Harry's 'notable services to DSIR'. The appointment is personal to Sir Harry and future secretaries of DSIR will not automatically become members of the Research Council.

Emerson Materials Available in UK

A NEW conductive caulking and sealing compound, and a silicone rubber foam of very low weight and extreme temperature stability are now available in the UK from the electronics division of Microcell Ltd., a subsidiary of BTR Industries Ltd., under its marketing agreement with Emerson and Cuming Inc. of USA.

Called Eccoshield VX, the caulking compound is said to be suitable as an airtight and watertight corrosion-resistant sealer for conduit joints and threads, and an rf-tight caulker for shielded enclosures. For the latter application, shielding effectiveness is comparable to that attained in all-welded construction. It is capable of insertion losses in excess of 100db from 200kc through 10kmc for both applications.

It does not harden with time, and is easily removed with conventional solvents. Volume resistivity of the paste itself is less than 0.1ohm-cm.

The rubber, Eccofoam SR, is a silicone foam of very low weight and extreme temperature stability. Useful as a thermal insulator to over 600°F. and as a lightweight thermal barrier, it has a low dielectric constant and exceptionally low dissipation factor.

The material is available in a limited range of densities from 9lb. to 12lb. per cu. ft.

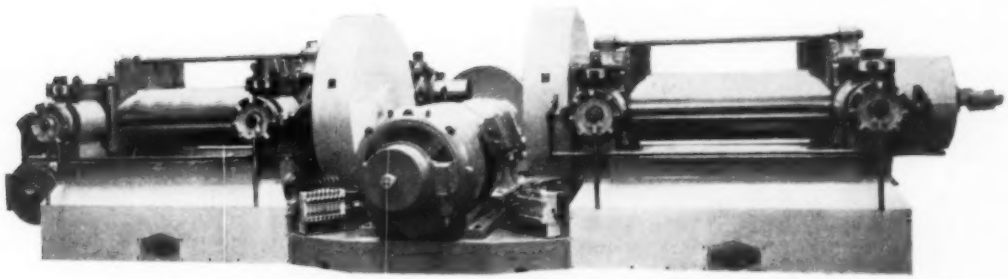
Polymer Liverpool Office

Polymer (UK) Ltd. has opened a new branch office at Yorkshire House, Chapel Street, Liverpool 2.

Two of the company's rubber technologists — F. Nield and S. Dempsey — are providing a technical advisory service for the area.

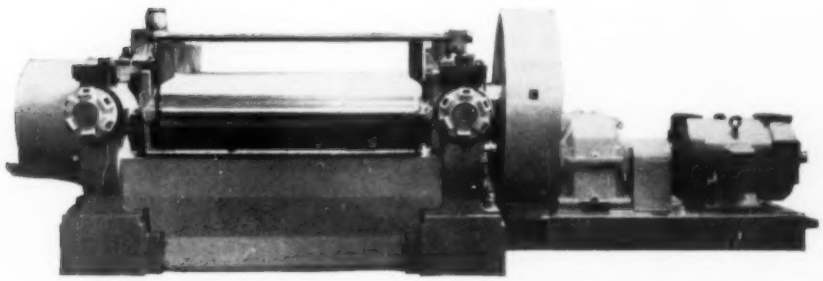
ROBINSON

SPECIALIST ENGINEERS TO THE RUBBER AND PLASTIC TRADE



A new Standard Design 22" x 60" Twin Mill arrangement on a Cast Iron Combination Vibro Mounted Bedplate with 200 H.P. Central Drive having a Spiral Bevel Helical Reduction Unit and Motor with Plug Braking Reversing Contactor Control and Lunn Type Low Position Safety equipment.

Special Mill design to include customers' particular specification ably dealt with by proficient and fully experienced personnel.



26" x 26" x 84" Mixing Mill with Cast Iron Combination Bedplate, Vibro Mounted and 150 H.P. Drive including D.H. Reduction Unit and Slipring Motor with reversing Contactor Control, suitable for emergency plug braking and Lunn Safety Equipment. Lubrication to Main Bearings by Wakefield Motor Driven Forced Feed Unit.

JOSEPH ROBINSON & CO. LTD. ESTABLISHED 1842

Tel: BLA 1866/7 SPRINGFIELD LANE · SALFORD 3 · LANCS · ENGLAND *'Grams: Opal M C*

VIEWS and REVIEWS

WHENEVER a newspaper, magazine or journal seems to be good and appealing all the way from cover to cover, someone is obviously struck. To me, and I hope to show why, such an issue was that of *Revue Generale du Caoutchouc* for October 1961, Vol. 38, No. 10, fasc. 405.

Tyre versus Ground

A large part of this issue is devoted to a consideration by several experts of the problem of constructing wheels and tyres which will efficiently transmit the tractive power of an agricultural engine on any type of ground whatsoever. There are four main contributions on this theme collected here, not written for the express purpose of this particular symposium and therefore it is natural that there should be some repetition, some overlapping, some disagreement, and a little trumpet blowing.

French Farm Logic

I will deal first with the most comprehensive of the papers, the one on pp. 1432-1440, by J. Remus, technical adviser on agricultural engineering to Dunlop, France. It is a long, detailed, competent survey of the nature and problems of ground-holding in the wheels of farm machinery.

Presented with that logicality for which the French are famed, among English-speaking peoples at least, it begins at the very beginning. Agriculture is based on tilling the soil and tilling depends on movement of the tiller: no movement, no agriculture.

How M. Remus asks, does the wheel of an agricultural machine move on a field? There are two processes: slipping and leverage (of which the wheel is an example). M. Remus then outlines the history of the tractor tyre, starting from the use of aeroplane tyres (almost by accident and certainly with misgiving), and going on to tread attachments like irons and crampons, moulded tread-bars, open-centre designs for the bars, soft and self-cleaning tyres, extra-wide tyres, and finishes this section by pointing out that 'each successive improvement makes less and less progress'.

Discussing the present position, he says that it seems that it is now the carcass of the tyre which is receiving most attention, especially in an attempt to increase the area in contact with the ground. This line of development has led to the 'belt' construction, to increasing sidewall softness, and finally to a consideration of designing to give individual points of tractive effort.

The importance of the working position of the tool being propelled through the ground is next dealt with, then increasing the weight on the wheels, altering the ratio between load and power, coupling of tyres, attachment of various gripping devices, half-caterpillars, four-wheel drives, and so to complete caterpillars.

He ends by a discussion of the mode of adhesion of a tyre to the ground: weight, bearing surface, tread height, thickness and disposition, reduction of inflation pressure, increased tyre softness, better control of power transmission, and so on. So comprehensive is the discussion that you might wonder what else there is to say.

Pressure Reduction

G. Le Pechon of Kleber-Colombes deals on pp. 1413-5, with the arched design of tyre carcass deriving from the observation that, in order to reduce wheel slip, tractor drivers would often reduce the inflation pressure of the tyres so as to increase the area in contact with the ground — of course, to the detriment of the life of the tyre.

He describes that tyre construction which permits considerable soft deformation in the direction of rolling while maintaining a transverse rigidity as well as resistance to puncture and shock.

This is achieved by the incorporation of 'protector' plies beneath the tread and whose cord angles are placed at a suitable angle to each other and the casing. The design has proved successful enough to effect savings of 10 to 20% in the cost of running the tractor.

Semi-Caterpillars

On pp. 1415-6, L. Ballu describes the semi-caterpillar's contribution to the problem. The very large wheels needed on tractors are expensive and if they could be reduced to a third of the diameter would make a welcome contribution to reducing the cost of agricultural operations. Caterpillar wheels can do this, theoretically, but they have not been developed for general agricultural purposes because they damage the terrain badly whether it be farm land being cultivated or road surfaces.

If, however, the caterpillar be relieved of the function of maintaining the longitudinal stability of the vehicle and be limited simply to providing points of driving traction, the half-caterpillar resulting would spread the driving load and so improve adherence to the soil.

Calculations and trials have shown that its dimensions can, in practice, be considerably reduced. Diagrams and photographs in this article show a number of possible arrangements and indicate their advantages compared with single wheels. 'The application of this technique', says the author in conclusion, 'will permit the rethinking of conventional tractor design, of motors for public works, and will bring about the conditions required in the vast expanses of the world at present under-exploited because of lack of means sufficiently simple and flexible'.

Wheel or Caterpillar?

G. Bonmartini has a very sharp and shining axe to grind. On pp. 1426-30, he surveys in an illustrated article the problems of transport on all types of terrain, with emphasis on the view he formed many years ago that the popularization of air travel was dependent to a large extent on the ability to land on any kind of ground, even the loose soil of a ploughed field, and that the most satisfactory answer to this problem was the caterpillar.

Under the title, 'Wheel on the Road, Caterpillar on Soil', he describes his researches in this field which led him to design a pneumatic caterpillar, which Pirelli ultimately brought to the production stage.

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

I cannot see why the aforementioned French logic did not suggest that these papers be arranged in the order I have given them, or, at least, as one group without intervening matter about other things and perhaps with an editorial comment that they do in fact constitute one symposium.

Foam Costs

Although air is cheap, free indeed, latex foam rubber is dear. Discussing 'Low-cost Manufacture of Latex Foam' on pp. 1443-52, of this *Revue Generale du Caoutchouc*, A. Sila and J. Leveque of the Institut Français du Caoutchouc, calculate that in 1959, world consumption of rubber in the manufacture of latex foam was of the order of 150,000 tons, of which about two-thirds was natural. Under the impact of competitive products and especially the so-called 'plastics' foams, it became necessary to reduce prices of foam rubber and cost analyses showed that it was the raw material itself in which the major reduction had to be made.

Experiments showed the difficulty of doing this by orthodox compounding methods because of the degradation in quality which occurred. Fillers like whiting, talc, or clay soon reduce the tear resistance so low as to render processing difficult and the product almost useless. Some grades of silica are better, and glass fibres can be used up to a point.

Grafted natural latex and stiffening by means of resins, etc., are all methods which reach a quality limit in one way or another. At the Institut, the authors have had more success with certain starches and with bitumen emulsions, both of which are quite well known in the industry.

Cheapening Problem

Some workers have preferred maize starch, others rice or potato. They have all been confronted by another problem. Because the foam is made in an aqueous medium, a large part of which is subsequently squeezed out and runs away down the drain, soluble substances, like starches may be largely lost, so it is natural to look for means of making them insoluble. As the authors say, many methods were proposed and patented for doing this. They themselves favour the use of tannin (which, by the way, had been used for insolubilizing the natural proteins of latex in the early days of latex foam research). The method has to be confined, they found, to medium and heavy density foams.

They were also successful with emulsions of bitumen (55% concentration and pH 10.5) whose particles proved to be compatible with the rubber particles. They found that up to 20% of the latex rubber could be replaced by bitumen — producing, of course, a dark rubber.

The whole problem of the cheapening of foams would be easier if their main applications were as simple space-fillers; they are occasionally used as such but by far the largest use is as upholstery, where they have to bear a load. Economically, therefore, different mixes cannot be compared merely by weight or volume, they must be compared primarily in load-carrying properties, sometimes called 'hardness' or 'compression modulus'.

It is a feature of many fillers and diluents in latex foam that repeated compressions reduce the hardness. Starch behaves in this way, ultimately losing over 40%. The authors found that, in this respect, bitumen was better and that a mixture of the two could give a final foam mix equivalent to standard.

End of the Road?

Does this foreshadow the end of latex foam? The authors present useful graphs showing the effects on the cost of latex foam of introducing a variety of fillers. (The data might have been even more useful if they had been calculated *after* a standard series of repeated compressions.)

Altogether, three graphs show that the maximum saving is about 30% by these methods, on a rubber cost of 2.50 NF. This is not enough to meet the competition of other foams; especially the polyurethanes based on polyethers (not polyesters, as given in the English translation).

They conclude, rightly, I think, but depressingly in view of the work already done and the theoretical possibilities, 'it seems that no further spectacular savings can be expected from the processes we have reviewed, unless some means are found to reduce by half the density of latex foams' (while maintaining, I must emphasise, *the load-bearing value)* and that the future lies with 'the actual reinforcement of rubber derived from latex'. They hope that 'searchers will tackle this challenging problem in the next few years'. I can assure the authors that 'searchers' did this years ago. It might prove more fruitful to tackle the problem economically on the plantations in order to reduce the price of the latex itself.

Also Rans

There is still much of interest, some of outstanding interest, in this issue of *Revue Generale du Caoutchuoc*. That they were 'also rans', as far as this review is concerned, was purely accidental.

P. 1406: Photograph of a glass road, used by Goodrich technologists for examining and filming from below, tyres in actual contact with the transparent road surface while the vehicle to which they are fitted is being driven along it.

P. 1407: Reduction of tramway noise by the use of rubber isolators on the chassis and by laying the rails on rubber.

P. 1409: Dunlop research on cooling of aero wheels, tyres, and braking system by forced draught from an electric fan.

P. 1455: When a natural rubber/ISAF black vulcanizate is stretched, the electrical anisotropy is higher than when a similar SBR vulcanizate is stretched. This leads to an interesting discussion of spatial distribution of carbon black particles in the two rubbers.

P. 1465: The damping properties of elastomers. An excellent study by M. A. Julien of the general theory of damping and its applicability to rubbers. Should be read by every rubber technology student and kept by every rubber physicist.

P. 1419: The properties of Firestone's Diene, polybutadiene rubber. Increased resilience, better ageing and abrasion resistance.

CHARLES JENNINGS.

MEN *and* MATTERS

A Review of People and Events

THE drive for brighter offices has derived considerable impetus from the use of plastics. Decorative laminates have been widely used for working surfaces and walls, and pvc fabrics have found many applications for wall coverings and upholstery.

A rather more recent development — and one which may considerably accelerate the use of plastics for structural purposes — is the coating of steel sheet with pvc. One company which has made a name for itself in this particular field is John Summers, manufacturer of Stelvetite vinyl-coated sheet steel.

The latest issue of the John Summers review, which I have been reading with some interest, is devoted to Stelvetite in the office. It describes the products of several manufacturers of office furniture and equipment and movable partition walling who make extensive use of Stelvetite.

The furniture at which you work and the walls around you can all — if you so desire — be made from steel covered with pvc. This material can be folded, lock seamed, riveted and bolted and all the techniques used to manufacture steel furniture can be used or modified to operate satisfactorily with coated steel.

Not only can an attractive range of easy clean fade-free colours be produced but many wood grain and hide effects and embossings can be achieved which greatly enhance the appearance of the products.

Jubilee Tyre Plant

When one hears so much about India's five-year plans one tends to think of any big industrial plant as brand spanking new. This is certainly not true of Dunlop's tyre factory at Sahaganj — which celebrated its silver jubilee recently. It began production in 1936 as the first

by Peter Richards

large-scale tyre manufacturing enterprise in India and to date has produced over 104m. tyres of varying size and types. It makes about 60% of India's automobile tyres and 80% of her bicycle and cycle rickshaw tyres.

The Sahaganj plant is one of the largest rubber manufacturing enterprises in Asia, producing a wide range of industrial rubber goods, bicycle rims and latex foam cushioning.

Tyres for the Boeing 707 aircraft are being manufactured for the first time in India at Sahaganj, while the belting for Asia's largest conveyor system at Bhakra-Nangal was designed and manufactured by Dunlop Sahaganj as well as India's longest single conveyor belt, over a mile long, soon going into operation at Neyveli Lignite project.

Paris in the Spring

It is by no means uncommon these days to hear people in our industry bemoaning the frequency with which exhibitions and conferences crop up in various parts of the world, forcing them to leave their comfortable offices and laboratories to suffer the discomforts of first class hotels in places like New York, Milan or Dusseldorf.

There is, however, one exhibition coming along in the not-too-distant future to which I at least am looking forward. Europlastique 62 is to be held in Paris from May 19 to 29 1962, and I can think of worse places to spend ten days in the spring. I imagine that a good many managing directors, instead of having to delegate someone to go, will find their arms being twisted to stretch the expenses a bit so that 'we can both go old boy — should be a very useful trip'.

According to the organizers, over 370 exhibitors from 14 countries have agreed to take space and some 80% of the 50,000 sq.m. available has been booked.

This is also one of the first major exhibitions to cater for both plastics and rubber and is being held concurrently with the 1st European Rubber and Plastics Conference. Papers at this conference will be read by technologists from many countries including France, the UK, USA, Germany, Holland, Belgium, Switzerland and Czechoslovakia.

Firestone Appointment

Byron H. Larabee has been elected vice-president in charge of all rubber operations for the Firestone Tire and Rubber Co. In this newly-created position, Mr Larabee will be responsible for the operations of the plantations in Liberia, the Philippines, Brazil and Guatemala, the synthetic plants in the US, France and India and Firestone's Xylos Co., with its rubber reclaiming facilities.

Mr Larabee joined Firestone in 1939 as assistant counsel. He was made executive vice-president and a director of the Firestone Plantations Co. in 1942 and was elected assistant secretary of the Firestone company and president of the Firestone Plantation Co. in 1956.

Room at the Top

D. Ferguson, who joined Dunlop as an office boy at Fort Dunlop in 1928, has been appointed production manager for tyres at the company's Speke (Liverpool) factory.

After working on the shop floor as an operator and foreman, he was appointed section manager for giant tyres. In 1950 he went out to the Dunlop plant at Sahaganj, India,

The new burnished finish to Bakelite Ltd.'s Warerite woodprints gives them the soft lustre of polished wood. The picture illustrates the reflective qualities of a French rose-wood print laminate in gloss finish (*top*) and burnished

where he was industrial engineer and later general production manager.

On his return to England, Mr Ferguson was made manager of the compounds department at Fort Dunlop, a position which he held until his move to Speke.

Safety Terylene

Fatal car accidents could be cut down by half if all car drivers and passengers wore seat belts. So any new seat belt is not just another commercial product, but a direct contribution to road safety.

A belt called the Defender, to be marketed next February, was demonstrated in London the other day.

The new belt is safe — and comfortable

Made by the Rochdale firm Tanfab Ltd., using Terylene webbing, it is a combined diagonal and lap strap, costing £4 15s. plus fitting.

BSI approved, it should be tough enough: it has a breaking strain in excess of 4,000lb.

An unusual feature is that the diagonal strap passes over the inside shoulder. This is because the upward and forward forces engendered in an accident induce a turning movement which pivots the body against a diagonal strap.

This reminds me, incidentally, that British Cellophane thinks a lot of its representatives. It has provided all its sales fleet cars with safety straps.

V. W. Slater Retires

Victor Wallace Slater, a director of Laporte Industries Ltd., has retired after 41 years of service to the Laporte Group.

Mr Slater joined Laporte at Luton as a chemist in 1920, was appointed chief chemist there in 1941, and joined the board of the parent company as chemical director in 1946. He also served for various periods on the boards of Laporte Titanium Ltd., Laporte Acids Ltd. and James Wilkinson and Son Ltd.

Recently, many of Mr Slater's colleagues met at Luton to mark his retirement, and where P. D. O'Brien (chairman of Laporte Industries Ltd.) made a presentation of a desk and accessories. He spoke of the high standards which Mr Slater always set and of the impressive growth of Laporte during his period of service.

Fred

Fred is a boffin-like type clad in dungarees, bow tie and horn-rimmed specs, and carrying an enormous spanner, who has recently been introduced to its customers by Midland Silicones Ltd.

'Fred is hard at it — showing silicones to engineers', says a special engineering supplement to *Midland Silicones News*. This slightly offbeat approach to potential users and customers makes the leaflet much easier reading, while still putting across plenty of factual information.

Fred (motto: For Resolving Endless Difficulties) is an eminently practical fellow. He personifies all the services that Midland Silicones have to offer engineers. In the supplement to *MS News* in which he makes his bow, he shows briefly the wide range of silicone products which are, or can be, used by engineers today.

It is not perhaps surprising that this approach appeals to me as I think it will to many people. The odd touch of humour can do a lot to leaven the technical lump.

From Soap to Rubber

Derek Hormel, an executive who started his business career in the sales department of Lever Brothers Ltd., and who joined Dunlop in 1958, has been appointed to the newly-created position of marketing manager for the tyre division at Fort Dunlop, Erdington, Birmingham.

Until recently advertising manager for the Dunlopillo Division at Harrogate, Mr Hormel's new job will be to co-ordinate the work of the various departments at Fort Dunlop concerned with the marketing and selling of tyres and accessories.

Appointments in Brief

Torrance and Sons Ltd. has appointed R. Ward as its Midland representative of F. M. Manning and Co. Ltd., which has recently appointed B. C. Hully as full-time representative for Torrance and Holmes Products.

* * *

Morane Plastic Co. Ltd., manufacturers of specialized laminating machinery, has announced the appointment of R. J. C. Brook as sales manager.

* * *

R. J. L. Wood has recently been appointed by British Geon Ltd. to act as representative for Hycar nitrile rubber and latex in the Southern sales area.

* * *

N. G. Bassett Smith, general manager of Dunlop Footwear Ltd., has been elected a member of the Council of the Liverpool Chamber of Commerce.

* * *

W. K. Ashcroft, MA, has been appointed market research manager of Howards of Ilford Ltd., a member of the Laporte Industries Group.

* * *

Blaw Knox Chemical Engineering Co. Ltd. has announced the appointment of E. V. Small to the board of directors.

* * *

G. B. R. Feilden, FRS, has resigned his present directorships in order to join the board of Davy-Ashmore Ltd. as technical director.

* * *

A. W. Wilson, formerly chief plastics engineer of Bristol Aerojet Ltd., has been appointed market development manager of Deeglas Fibres Ltd.

* * *

W. J. S. Austin has been appointed assistant general manager of the southern branch of Reed Cartons Ltd.

* * *

W. Crosland has been appointed director and general manager of Uni-Tubes and of its subsidiary Portland Plastics.

'Surface activator — the brandy on the Christmas pud.'

THE LEGAL ANGLE

Vendor Restraint Clauses

By a Barrister

WHEN a reader of this column bought out a competitor in the same line of rubber trade, little did he think that, a short time later, he would discover the vendor back in business, competing against him and circularizing his old customers.

'After all', the purchaser remarked, with a great deal of truth, 'what was the point of my paying an exorbitant sum to acquire goodwill which the vendor immediately proceeds to win back to himself?'

But whatever the point, the question our reader wanted answered was simply this, 'Can the other man behave like that?'

This very point was considered by the House of Lords in 1895. Here is what Lord Macnaghten said. 'A person who sells the goodwill of his business is under no obligation to retire from the field. Trade he undoubtedly may, and in the very same line of business. If he has not bound himself by special stipulation, and if there is no evidence of the understanding of the parties beyond that which is to be found in all cases, he is free to carry on business wherever he chooses'.

So the basic rule is that, in the absence of agreement to the contrary, the vendor can open up next door, the next day, competing in an identical line of trade.

'But, then, how far may he go?' the learned Judge queried. 'He may do everything that a stranger to the business, in ordinary course, would be in a position to do. He may set up where he will. He may push his wares as much as he pleases. He may thus interfere with the custom of his neighbour as a stranger and an outsider might do; but he must not, I think, avail himself of his special knowledge of the old customers to regain, without consideration, that which he has parted with for value. He must not make his approaches from the vantage ground of his former position, moving under cover of a connexion which is no longer his. He may not sell the custom and steal away the customers in that fashion'.

So while the vendor can compete, he may not circularize his former customers. Naturally, he may advertise, and if that advertisement brings old customers back to him, the purchaser will have no lawful complaint. But if he makes a dead set at his former connexion, he is 'derogating from his grant' and can be restrained by injunction.

These are the general rules, but if you are about to purchase a business, you should make certain that there is a restraint clause, forbidding the vendor to enter into competition with you. Because these restraint clauses are only enforceable if they are 'reasonable' — in exactly the same way as a clause which would prevent a former employee from competing, after leaving your service — do not be so unwise as to try drafting it yourself. Purchases of businesses should be left to lawyers. If they are not, the results may be disastrous.

Plastics Safety

The Birmingham Industrial Accident Prevention Group has opened a new extension to its training centre at Acocks Green, where new courses include studies in plastics.

Welcoming the new extension, Brig. Ralph Stoney, director general of the Royal Society for the Prevention of Accidents, underlined the achievements of the group. Among the 2,000 students in 1961, 500 apprentices had passed through the training course (nearly double last year). There were 250 foremen and supervisors (100 increase), 150 crane drivers and slingers (nearly double last year's figure).

MS Plant Expansion

Midland Silicones plant expansion has been taken a further stage by the award of a contract to design and construct tank farm additions complete with piping network, at its Barry, Glamorgan, plant.

This will give an increased storage capacity of 120,000 gallons of raw materials and products.

The contract has been awarded to the chemical engineering division of the Sturtevant Engineering Co. Ltd., London, E.C.4, and work is scheduled for completion by June 1962.

Sturtevant's already has in hand for Midland Silicones the design and construction of a new reactor unit, and the work will be completed this year.

Smith Resin Division

H. A. Smith Ltd. of Braunston, near Rugby, has formed a separate resin division.

New laboratories have been set up to undertake further development work on the Tenaxatex range of synthetic resin emulsions, and to provide an extension of the technical service facilities.

Geigy Price Cuts

Geigy Co. Ltd. has reduced the prices of a number of its plasticizers, including sebacates, azelates, adipates and phthalates. The reductions, states Geigy, are because of recent cuts in the price of certain alcohols.

In addition, the price of phthalic anhydride has been reduced, and this is reflected in a greater price reduction of Geigy phthalate plasticizers compared to the other products mentioned.

A striking example of the use of a decorative laminate in this mural showing St. George and the Dragon for a modern church

Laboratory Mill Safety Guard

I.C.I. DEVELOPS IMPROVED DESIGN

By G. L. BATTY (I.C.I.)

IN 1952 the first safe guard for a horizontal two-roll laboratory mill was designed by R. W. Lunn of the Leyland and Birmingham Rubber Co. The guard described has been developed from Lunn's original design.[1]

The guard shown is designed to protect the operator on a laboratory horizontal two-roll rubber mill from the danger of the running nip between the two rolls, and also from the dangers of the running nips between the rolls and the guard, and between rubber being fed through the guard into the machine and the guard. It achieves this protection while maintaining a clear view of the mixing operation, and without obstructing the addition

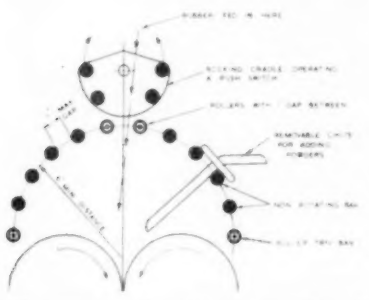


Diagram showing the construction of the improved laboratory mill safety guard developed by Imperial Chemical Industries Ltd.

of fillers, the manipulation of the rubber on the roll face, or cleaning down after a mix is completed.

Rocking Cradle

The running nip between the rolls is guarded by a cage formed of bars with 1in. gaps between them, fitted over the rolls at a distance of at least 6in. from the running nip between the rolls. This cage prevents the operator putting his fingers between the rolls while permitting a good view of the mixing operation.

The two centre bars of the cage are made to rotate freely so that rubber can easily be fed between them into the machine. Once the rubber has been gripped by the main rolls it is dragged slowly through the guard forming a running nip between the rubber and the guard. The operator is protected from injury in this running nip by a rocking cradle fitted above the guard. If his hand is caught by the rubber his hand will be pulled down against one side of this cradle, causing it to tilt, and, by means of a cam, to press a stop switch, which can only be released by restoring the cradle to the horizontal.

The stop switch cuts off the power, and allows a powerful mechanical brake to come into operation, bringing the machine to rest in a total time of about a quarter of a second.

After the rubber has passed between the main rolls it is passed by hand round the surface of the front roll to form a continuous band and then, in proper sequence, various powders or liquids are added and the rubber manipulated by hand on the roll face until mixing is complete.

Trip Bar

In performing these operations the operator is exposed to the danger of the running nip between the guard and the roll. To remove this danger, part of the cage at both sides of the machine is mounted on hinged plates so that if it is pushed in the direction of roll rotation the bar on the guard nearest to the roll (the trip bar) moves tangentially in the direction of roll rotation, causing a stop switch to be pressed, and bringing the rolls to rest in about a quarter of a second, during which time the roll surface moves forward between 2in. and 3in. As before, the machine cannot be restarted until the guard is restored to its working position. The position of the trip bar with respect to the roll surface and the running nip between the rolls must be so arranged that the rolls are stopped before an operator's hand could be dragged into the running nip between the rolls. A suitable formula[2] for finding a position for the trip bar is

$$D = 1 + S + 8(W - \tfrac{1}{4})\text{in.}$$

where D = Distance from the trip bar to the point where the running nip between the rolls is $\frac{1}{4}$in. wide.

S = stopping distance in inches.

W = the gap between the trip bar and the roll surface.

For convenience in operation the trip bar is made to rotate so that slight contact with the material being mixed does not trip the guard and stop the machine.

To enable the machine to be cleaned down between mixes the hinged parts of the cage can be swung wide open, exposing the rolls for easy cleaning. In this position the stop button is kept pressed down so that the machine cannot be started until both parts of the cage are returned to the closed position.

The original version of this article was published in I.C.I.'s 'Safety Bulletin'. Further information on these guards can be obtained from the Research Department, I.C.I. Ltd., Alkali Division, Northwich, Cheshire.

REFERENCES

1. "Safe Working on Horizontal Two-Roll Mills'. Published by the National Joint Industrial Council for the Rubber Manufacturing Industry, 1952.
2. "Safety of Machine Tools and Other Plant. No. 4: Guillotines and Shears'. Published by Her Majesty's Stationery Office, 1952. Reprinted 1955.

These two views show the guard fitted to a laboratory mill. (*Left*) raw rubber being fed into the running nip through the rocking cradle and (*right*) one hinged part of the cage swung open to expose the rolls for easy cleaning

BOOK REVIEW

Source Book of The New Plastics

SOURCE BOOK OF THE NEW PLASTICS, Volume 2, by Herbert R. Simonds, published by Reinhold Publishing Corporation, 310 pages, price 72s.

Seventy per cent. of this book is a collection of data on new materials, supplied by the 69 firms who have produced them. There are over 100 graphs and tables of comparative properties. In an introductory chapter the editors of four leading American plastics journals give their opinions on the highlights of recent developments.

Mr Kohndic, editor of the SPE Journal makes a significant point when the highlights work aimed at providing 'engineering equations' for application of plastics. It is less encouraging to see, however, very little progress in the field of measuring processing properties, as against physical properties of the finished product. It is common knowledge that the processing techniques used with plastics have very significant effects on the ultimate properties, particularly in moulding and extrusion. Very little guidance is given to the fabricators on how to achieve efficient and reasonable cost production. Of what value for example is the information that 'Muckite, our new thermoplastic, can be successfully compression and transfer moulded'. Realistic processing instructions enable a fabricator to evaluate the risk he takes in pioneering a product made from a new plastics and in the long run will speed up the sorting of the wheat from the chaff.

The dust cover of the book mentions the price of the new plastics as one of the features considered. This is a second important factor in evaluating new plastics, yet only eight explicit references to prices were noted in the text. There is a true story of a telephone engineer, who in the early days of ptfe, specified this material for a handset. He may have read with interest a physical properties list; he certainly did not take the same account of price and processing information.

The book ends with a chapter on government sponsored research, which is a valuable summary. A similar collection of published research results in this country, made at regular intervals, would help to bridge the gap between research and application. In general, the book suffers by being on a too commercial, insufficiently scientific basis.—J. T. N.

Sternite for Ekco Toilet Seat

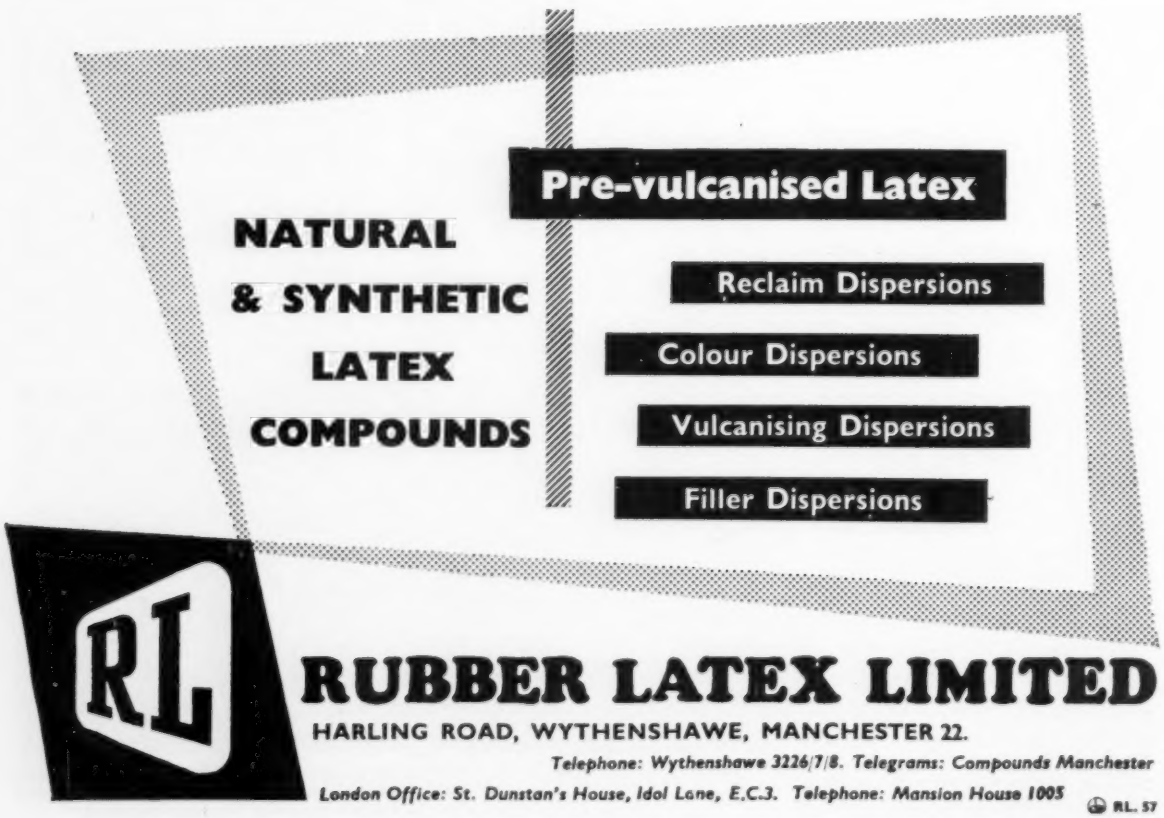
A specially developed general-purpose grade of Sternite Moulding Materials Ltd. black phenolic moulding powder — meeting BSS 771 type GX requirements — is being used by Ekco Plastics Ltd., Southend-on-Sea, for the production of a new contract toilet seat.

Longer-life Aprons

A new apron with longer life and greater resistance to absorption of fats and oils is now being produced for the food and allied trades by the Dunlop Rubber Goods Division. Made of a nitrile rubber/pvc cotton-backed material, the apron is also free from plasticizer extraction which normally leads to stiffening up and cracking.

Adhesive Quilting

A new, self-adhesive quilting, made of pvc is being manufactured by the Quilton Division of Dalmas Ltd., Leicester. Quilton quilting which can be applied to rubber, plastics, glass, wood and concrete surfaces, is tenacious and non-curing.



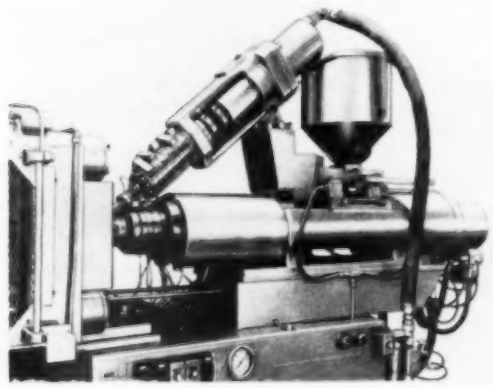
PLASTICS MACHINERY DEVELOPMENTS

Sund-Impco Moulding Machines

SINGLE AND TWO-STAGE INJECTORS

By JOHN SHEARING

THERE is an increasing tendency for machine manufacturers to provide alternative equipment to increase the range of their products. The Sund-Impco injection moulding units have been carried to an extreme in this direction since there are eight different screw plasticization systems.



An increase of plasticizing capacity is one of the advantages of this second-stage injector for the Sund-Impco injection moulding machine

Impco injection moulding machines are made in the USA by Improved Machinery Inc., whose experience in this field goes back as far as 1943. They have licensed Sunds Verkstader AG, of Sweden, to manufacture their equipment so that the new line of Sund-Impco has been created. This company is represented in the UK by Omni (GB) Ltd.

The basic machine is the SHA8-275 which is essentially a single stage reciprocating screw machine. However, this may readily be converted to a two-stage injector which gives a number of further advantages.

Single Stage Output Rate

The machine has been designed to give maximum output. It has a plasticizing capacity of 50 kg./hr. and a dry cycle time of less than 5sec. with the full clamp stroke. Because the latter is adjustable within broad limits, it is possible to cut down idle time to a minimum.

The hydraulic knock-out also saves cycle time as the mould opening speed does not need to be reduced to avoid damage by ejection to the moulded parts. A high injection rate at a high injection pressure obviously means a short mould fill time. Even shorter filling times can be obtained by using a special nozzle valve. There is also a nozzle centring apparatus.

Other Features

The heating system for the cylinders has three independently controlled units and the temperature of the nozzle may also be controlled.

Very exact cycle control is obtained and secondary injection pressure is provided. The controls enable the machine to operate completely automatically, to give a single cycle automatic control, timed semi-automatic control and manual cycling.

The T-slots in the mould platens make it easy to install moulds of different sizes. The hydraulic system is particularly well designed and there is positive full pressure clamp holding, a variable injection pressure adjustment and a secondary holding pressure adjustment. A rapid traverse injection circuit is also provided. Details of the single stage injector are given in Table 1.

Two-Stage Injection

The machine already described includes a reciprocating screw for preplasticization. The second type of machine employs a fixed screw with a separate injection cylinder. In this way the machine can be equipped for shot sizes of 16-42 cu. in. and plasticizing capacities of 75-155 kg./hr. The versatility of the machine can also be increased with special screws for injection pressures higher than normal which enables all thermoplastic materials to be moulded. Special features such as automatic core pulling or unscrewing and multiple nozzles can be included if required.

The use of the two-stage injector gives several advantages. Up to 25% increase of plasticizing capacity is obtained, the cycle time can be reduced by up to 20%, the speed with which the material is injected into the mould can be increased three-fold, effective injection pressure can be increased up to 50% and raw material is saved since each shot is regulated precisely and excessive packing of material is avoided.

TABLE 1
SUND-IMPCO INJECTION MACHINE
SHA 8-275

Clamping Mechanism	
Toggle clamp, pressure adjustable up to ..	250 tons
Clamp stroke, adjustable from	130—360mm.
Clamp daylight, closed, adjustable from ..	160—460mm.
Mould platen, minimum dimensions:	
Overall, horizontal and vertical	648 × 686mm.
Between tie rods, horizontal and vertical	385 × 425mm.
Hydraulic retraction from nozzle, stroke ..	405mm.
Injection Mechanism	
Injection capacity, polystyrene, rated ..	230—280g.
Injection plunger pressure	120kg./cm.²
Oil pressure	1,575kg./cm.²
Plunger diameter ..	70mm.
Injection rate, calculated	225 cm.³/sec.
Plasticizing capacity ..	50kg./h.
Feed hopper capacity, polystyrene ..	50kg.

The change also simplifies nylon moulding, gives improved surface quality through precise temperature control, gives better colour dispersion and allows increased mould area to be employed.

Details of the operational characteristics of both types of machines are given in Table 2.

TABLE 2
OUTPUTS OF DIFFERENT SCREWS

	Reciprocating Screw			*Fixed Screw and Injector*				
	R 275 RS 200	R 500 RS 250	FS 175 F 500	FS 175 F 800	FS 225 F 500	FS 225 F 800	FS 280 F 500	FS 280 F 800
Shot size, maximum (cu. in.)	16	32	30	50	30	50	30	50
Injection pressure at 1,750psi oil pressure (psi)	14,000	14,000	15,000	15,000	15,000	15,000	15,000	15,000
Injection rate, calculated (cu.in./sec.)	22.4	22.4	21	21	21	21	21	21
Plasticizing capacity, polystyrene (lb./h.)	195	275	165	165	275	275	340	340

Rubber Statistics

WEST GERMANY—FRANCE—JAPAN—USA

WEST Germany's rubber tyre production during October rose further to 21,979 tons (provisional) from 21,540 tons (revised) in September and 20,277 tons in October of last year, according to the Federal Bureau of Statistics.

Production in the first 10 months of this year totalled 199,748 tons (provisional) which compares with 192,609 tons in the same period of last year.

Output of other hard and soft rubber goods during October was 24,091 tons (provisional) against 23,432 tons (revised) in September and 24,072 tons in October of last year. In the first ten months of this year it amounted to 233,922 tons (provisional) against 234,417 tons in the corresponding period of last year.

Imports of natural rubber and rubber sole crepe during September totalled 12,129 tons (provisional), including 6,584 tons from Malaya, 1,820 tons from Thailand, 1,340 tons from South Vietnam and 661 tons from Ceylon. In the first nine months of this year, imports totalled 89,270 tons (provisional), including 51,273 tons from Malaya, 10,251 tons from Thailand, 6,281 tons from Nigeria and 6,379 tons from South Vietnam.

Imports of synthetic rubber in September totalled 5,427 tons (provisional) including 2,679 tons from the United States, 886 tons from Canada and 775 tons from France. In the first nine months of this year they totalled 37,540 tons (provisional), including 19,738 tons from the United States, 7,392 tons from Canada, 3,126 tons from Italy and 3,118 tons from the Netherlands.

France

French tyre production in August totalled 7,555 tons and in September 23,875 tons, according to statistics issued by the French Ministry for Industry and Commerce. This compared with 22,805 tons in July, and brings total production in the first nine months of this year to 192,060 tons compared with 186,440 in the comparable period last year.

Imports of tyres in August totalled 1,065 tons and in September 986 tons, bringing the total imports for the first nine months of 1961 to 8,778 tons. Exports for August totalled 4,687 tons and September 4,053 tons, compared with 5,989 in July.

Industrial rubber production in August amounted to 8,100 tons and in September (provisional figures) to 19,760 tons compared with 16,470 tons in July. Production in the first nine months of 1961 totalled 159,230 tons, against 157,985 tons in the same period last year.

Japan

The Rubber Manufacturers Association of Japan has announced the production of rubber articles during October amounted to 20,654 tons, compared with 20,459 (revised) tons in September. A breakdown of the October output of rubber articles with comparable September figures (revised) is as follows:

	Oct.	Sept.
Motor car tyre tubes ..	9,860	9,772
Bicycle tyre tubes ..	694	686
Rubber-soled canvas shoes	982	912
Rubber shoes	1,637	1,597
Belts	1,236	1,271
Industrial uses	2,823	2,831

United States

The United States Rubber Manufacturers Association has issued the following rubber statistics for October (in tons, with figures for the previous month in brackets). Total consumption of new rubber 145,568 (130,600). Consumption of natural rubber 40,245 (36,956). Consumption of all synthetic rubber 105,323 (93,644). Consumption of SBR 85,500 (75,554). Production of all synthetic rubber 133,666 (116,603). Production of SBR 105,075 (93,614). Total synthetic rubber exports 28,070 (22,900).

Our Droitwich Factory can supply you with

LATEX CASTING COMPOUNDS
DIPPING COMPOUNDS
PRE-VULCANISED LATEX
DISPERSED COLOURS and
DISPERSED CHEMICALS for
LATEX WORK

Plus first class technical advice if you have a problem

WITCO CHEMICAL CO., LTD.

Head Office: **BUSH HOUSE, ALDWYCH, LONDON, W.C.2**
Telephone: TEMple Bar 0473/6476
PEARL HOUSE, PRINCESS ST., MANCHESTER, 2 (Central 9066/8) 62 ROBERTSON ST., GLASGOW, C.2 (City 3495)
FACTORIES, LABORATORIES AND SALES OFFICES—
U.S.A. · CANADA · GT. BRITAIN · FRANCE · HOLLAND

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

THE directors of the DISTILLERS giant called half-time just recently with an interim dividend of 6% which was in line with the forecast made last July. Trading profits of the group for the six-month period ending September 30, after allowing for the depreciation charge, was estimated at £16,125,000 as against £15,922,000 for the same period of time in 1960. Income from trade investments brought in £610,000 as compared with last times £556,000. Shareholders were told that during the half-year home and export sales of Scotch whisky and gin were satisfactory despite the unsettled conditions of the home market arising from the Chancellor's imposition of increased duty.

But it was a different story for the industrial side of the business which now includes BRITISH XYLONITE, the plastics firm. This group, it appears, experienced a sharp reduction in profit even though the volume of turnover was reasonably maintained. It seems, however, that in the latter part of the six-month period under review there was 'exceptional' competition from overseas to which the chemical and plastics industries, in particular, were subjected. These conditions which are affecting profit margins, still prevail, the board warned shareholders.

Not such a happy Christmas for those interested in the FRANCIS SHAW business. Provisional trading figures do not justify the payment of an interim for 1961. In the previous year the half-time handround of 7½% was followed by a final of 12½%. The decision comes as something of a surprise for last June the directors stated that a good level of profits could be achieved and that the order book was good. Steps had been taken to increase productivity and reduce expenses.

Lord Keyes, chairman of DANNIMAC, reports that group turnover for eight months of the current year shows an increase compared with 1960. Forward orders taken for the 1962 spring season are again at a satisfactory level. Direct costs and overheads continue to rise but the directors are confident that the results of the present year will be good. Group profits are returned at £245,387 which is a little lower than last time. The dividend remains pegged at 7½%. This is the same rate paid since the shares were marketed in 1956. Lord Keyes says that it remains his policy to conserve resources to be applied generally in the furtherance of the company's activities. Up to and including April 1960, commission payable under agreement with the managing director had been waived by him. In the 1960-61 accounts the year's commission amounting to £13,000 has been charged.

This is a year that investors will no doubt like to forget about — that is unless they managed to sell out at the

Continued on page 1032

Share Price Movements

Par Value	Company	1961 High	Low	Dec. 9	Latest
£1	A.E. Ind. Ord.	48/6	28/3	30/3	28/6
5/-	Albright & W. Ord.	29/6	20/3	23/-	22/6
£1	" " " 5% Pref.	17/3	13/-	13/6	13/6
5/-	Anchor Chemical Ord.	25/6	15/3	15/9	15/10½
4/-	Airfix	43/6	17/-	38/6	38/6
4/-	" Non Voting	36/9	16/-	32/-	33/-
5/-	Andersons Rub. Ord.	—	—	3/9	3/9
£1	Angus Geo. Ord.	83/-	58/6	68/6	68/6
5/-	Ault & Wiborg Ord.	17/-	12/9	15/-	15/6
£1	Avon India Rubber Ord.	46/6	30/-	37/6	37/6
£1	" " " 6% Pref.	19/3	14/9	15/-	15/-
10/-	Bakelite Ord.	66/3	36/-	38/9	36/9
£1	" 6% Pref.	19/3	16/3	16/9	16/9
£1	Baker Perkins Ord.	59/6	40/6	45/-	45/-
4/-	Bank Bdg. Rubber Ord.	3/6	1/9	2/-	2/-
4/-	Bettix	11/9	7/6	8/9	8/9
4/-	Brammer H. Ord.	17/-	13/9	13/9	13/9
10/-	Bridge, David Ord.	60/-	27/-	27/6	27/6
5/-	Bright, John Ord.	9/6	6/-	7/3	7/3
5/-	Brit. Blting. & Asb. Ord.	24/-	17/6	19/6	19/7½
£1	" " " " Pref.	14/-	12/6	13/3	13/3
5/-	British Electronic Indus.	15/6	9/6	11/3	10/1½
£1	BICC Ord.	62/6	49/-	56/9	56/3
5/-	BTR Ind. Ord.	18/9	8/9	9/6	9/7½
£1	" " 7½% Pref.	21/6	19/6	20/-	20/-
10/-	Castrol Ord.	52/-	36/-	39/6	39/6
£1	Courtaulds Ord.	47/6	26/3	28/-	29/9
£1	" 5% 1st Pref.	16/-	13/9	13/9	13/6
£1	" 6% 2nd Pref.	18/3	15/9	16/6	16/6
4/-	Cow, P. B. Ord.	10/6	7/6	8/6	8/6
£1	" " 5% Pref.	14/3	12/6	12/6	12/6
5/-	Daniels (T. H. & J.) Ord.	—	—	8/-	8/-
1/-	Dannimac Mfg. Ord.	16/3	10/6	15/-	14/3
10/-	De La Rue Ord.	70/-	44/9	54/-	52/-
£1	" " " 3½% Pref.	10/6	9/6	10/-	10/-
10/-	Distillers Co. Ord.	41/3	31/-	38/6	37/1½
£1	" " " 6% Pref.	20/3	17/-	18/-	18/-
£100	" 5% Conv. Loan	£96	£90	£91½	£92
£100	" 5½% Unsec. Loan	£86½	£72	£76½	£77
10/-	Dunlop Rubber Ord.	29/-	21/6	28/6	29/3
£1	" " 5½% Pref.	16/-	13/9	15/6	15/6
£100	" 3½% 1st Debs.	£69	£67	£68	£68
£100	" 4½% 2nd Debs.	£79	£74	£74	£74
£1	Eng. Elect. Ord.	40/6	22/6	25/3	23/-
4/-	Ebonite Cont. Ord.	8/6	4/9	5/-	5/-
£1	English China Clays Ord.	117/6	80/-	101/3	102/-
£1	Goodyear Tyre 4% Pref.	11/6	9/9	10/-	10/-
5/-	Greeff Chem. Ord.	37/7	21/6	22/-	22/-
10/-	Greeff Chem. 5½% Pref.	8/3	6/9	7/-	7/-

Par Value	Company	1961 High	Low	Dec. 9	Latest
4/-	Greengate & Irwell Ord.	6/9	3/3	3/6	3/6
5/-	Hackbridge Hldg.	6/9	4/6	4/6	4/4½
£1	Harrisons & Crosfield Dd.	57/6	42/-	46/-	46/6
1/-	Hunt & Moscrop Ord.	2/3	1/3	2/-	2/-
£1	Imp. Chem. Ord.	81/6	55/3	58/3	58/9
£1	" " 5% Pref.	16/3	13/6	14/-	14/-
£100	" 4½% Unsec. Loan	£83	£76½	£80	£80
£100	" 5½% Conv. Loan	£93	£86	£87½	£87½
5/-	Laporte Ind. Ord.	28/9	18/3	20/9	19/3
£1	" " 7½% Pref.	23/-	20/-	20/-	20/-
£1	Leyland & Birm. Rubber Ord.	59/3	37/6	42/6	42/-
£1	" " " 6% Pref.	18/9	15/-	15/-	15/-
2/-	London Rubber	15/6	9/6	14/6	14/9
£1	" 6% Red. Cum. Pref.	20/-	16/9	17/6	17/6
£1	McKechnie Bros. Ord.	43/-	27/-	37/-	37/-
£1	" " 'A' Ord.	45/-	32/-	32/-	32/-
£1	" " 6% Cum. Pref.	18/-	16/-	16/6	16/3
5/-	Monsanto Chem. Ord.	27/6	14/6	16/9	16/9
£1	" " 3½% Pref.	12/6	10/9	11/-	11/-
£100	" " 6% Debs.	£98	£88½	£91½	£91½
5/-	Miles (H.G.) Hldgs. Ord.	10/-	7/-	10/-	10/-
2/-	Movitex	7/6	4/6	4/9	4/9
4/-	North, J., & Sons 'A'	26/-	17/3	25/9	25/9
£1	North British Rubber	21/3	10/9	11/3	11/3
5/-	Northwestern Rubber	13/-	9/-	11/-	11/-
5/-	Plastic Enginrs. Ord.	40/-	28/3	30/-	30/-
10/-	Projectile & Eng. Ord.	50/6	22/6	24/-	24/-
5/-	Redfern Holdings Ord.	4/-	2/9	3/6	3/6
2/-	RFD Ltd. Ord.	6/3	3/6	5/-	5/-
£1	" " 5½% Pref.	15/-	10/6	11/3	11/3
2/-	Rubber Imp. Ord.	6/3	3/-	3/3	3/3
2/-	" " 'A' Ord.	5/-	2/3	2/3	2/3
£1	" " 5% 1st Pref.	13/3	11/3	12/-	12/-
5/-	Rubber Reg. Ord.	18/3	12/3	12/3	12/3
4/-	Shaw Francis Ord.	24/6	12/3	12/6	12/6
£1	Shell Ord. (Reg.)	140/-	108/-	117/3	119/3
2/-	Silentbloc Ord.	10/6	7/3	8/-	8/-
5/-	Storey Bros.	46/-	26/9	28/9	28/9
2/-	Sussex Rubber Ord.	2/7½	1/9	1/9	1/9
5/-	Sutcliffe Speak Ord.	18/6	12/6	12/6	12/6
£1	Tootals	35/6	22/9	23/6	22/9
£1	Turner & Newall Ord.	78/-	55/-	58/3	58/-
£1	" " " 7% Pref.	21/6	19/-	20/-	20/-
5/-	Universal Asbestos Ord.	27/-	20/-	21/6	21/6
£1	Venesta Ord.	76/-	55/9	63/-	63/9
5/-	Viscose Dev. Ord.	16/3	13/3	14/9	14/9
5/-	Warne W. (Holdgs.) Ord.	21/6	14/9	18/-	18/-

Industry INTELLIGENCE

Technical Data

Polysar Products

The three most recent Technical Reports issued by Polymer Corporation Ltd., and available in this country from Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4, are Nos. 61: 10A, 10B and 10C.

Report No. 61:10A describes the compounding and properties of a Polysar Krynac 803 compound used for the proofing of protective clothing. It can be frictioned onto cotton ducks and synthetic fabrics such as Terylene, Dacron or Dynel, or spread on tightly woven fabrics, to produce proofed materials, light in weight, cool and extremely durable.

61:10B gives mixing details and properties of a Polysar Butyl 600 compound designed for use in inner tube valve base stocks. This is capable of fast cure, is impermeable to air, has excellent physical properties and good adhesion to brass.

Report 61:10C gives a recipe for a light-coloured SBR pencil eraser compound. This is based on Polysar Krylene 602 and was selected because of the ease with which it accepts pigments and high loadings of factice.

Filon Sheeting

In a new 20-page brochure, issued by BIP Reinforced Products Ltd., Streetly Works, Sutton Coldfield, are the facts about Filon reinforced plastics translucent sheeting.

Technical data is given on Filon's physical properties of fire and chemical resistance, durability and strength, light and heat transmission, uniformity of manufacture and fixing details and limitations.

Filon's self-extinguishing quality has been severely tested, and is above the standards demanded by local authorities, most of which have accepted both the self-extinguishing and the general purpose grades. The material also has the approval of the Ministry of Works, the War Department, the Air Ministry and the London County Council.

Publications

Recticel

A recently-published brochure issued by The Sutcliffe Moulded Rubber Co. Ltd., Impact Works, Church Street, Ossett, describes some of the uses of Recticel. This is a honeycombed rubber material which traps air in each of its cells, to produce a highly-resilient cushion. The material is produced in a variety of densities to give varying degrees of hardness and is available in any shape or size. Established applications include upholstery and loose cushions, special purpose matting for hospital uses and packaging.

Rubber in Roads

Rubber in Roads, Bulletin No. 16, published by the Natural Rubber Bureau, 19 Buckingham Street, London, W.C.2, describes the use of a new maintenance treatment for roads, rubberized slurry seal, in South Africa, where the hot dry climate 'can play havoc with even the best of road surfaces'.

The bulletin states that ordinary slurry seal 'did not at first prove particularly successful, as within a short time the slurry layer was found to crack in sympathy with the movement of the existing fissures underneath. The obvious answer to this was to improve the elasticity of the asphalt binder by adding a percentage of rubber'.

The National Institute for Road Research, South Africa, has put down several experimental sections of rubberized slurry seal, which was originally pioneered by the Cape Provincial Roads Department. Johannesburg City Council and Durban Corporation have also put down trial stretches and it has been used for resurfacing work at Salisbury Airport.

Rubber Components

Tempered Rubber Components Ltd., PO Box 17, Warren Street, Sheffield 4, a member of the Tempered Group of companies, has recently published three new leaflets dealing with its products.

Entitled 'Rubber and Industry', 'Rubber and Railways' and 'Rubber and Road Vehicles', the leaflets show a representative range of mouldings, extrusions and fabrications in both natural and synthetic rubber which the company has made for a variety of applications.

The field in which Tempered Rubber Components specialize is the bonding of rubber to metal; in this work it has direct contact with the associated Tempered Spring Co. for specialist advice and the supply of metal parts.

Terylene Hose

The Fibres Division of Imperial Chemical Industries Ltd., Hookstone Road, Harrogate, Yorkshire, has recently produced a booklet on Terylene reinforced industrial hose.

The booklet describes the many varied applications in which advantage has been taken of the useful combination of properties of Terylene: great wet and dry strength; low extension; good heat and chemical resistance; low absorbency; good abrasion resistance and immunity to rotting.

Among the applications mentioned in the booklet are hoses for oil, water cooling, car brakes, low temperature, divers' air supply, aircraft cooling and warming, mining, fire fighting, rocket and submarine refuelling.

Aerolite Applications

Technical Notes No. 226, issued by Ciba (ARL) Ltd., Duxford, Cambridge, is called shopfitting and barfitting. In it are illustrated some recent examples of shopfitting, barfitting and similar work incorporating Ciba adhesives. The wide adoption of decorative laminates for working surfaces in shops, public houses and club rooms has greatly increased the use of these adhesives. The illustrations in the pamphlet show the wide and attractive range of effects which are now possible — thanks both to the laminate and adhesive manufacturers.

Machines, Materials and Equipment

Humidity Instruments

A new 16-page leaflet (List 70/1) issued by the Cambridge Instrument Co. describes its range of hygroscopic and wet and dry bulb humidity indicators, recorders, and controllers. The leaflet begins with an introduction to the measurement of relative humidity and its importance in industry, and describes and illustrates the two common methods of measurement.

The instruments described include a hygroscopic indicator for measuring the moisture content of paper and similar materials, mechanical and electrical wet and dry bulb recorders, combined temperature and humidity recorders and various types of controllers including a multi-point electronic recorder/controller.

The publication also provides general information on several humidity control systems and contains a short bibliography relating to other sources of information on the measurement and control of humidity.

Laboratory Stirrer

Griffin and George Ltd., Ealing Road, Alperton, Wembley, has added to its range of laboratory stirrers the new Griffin-Citenco Stirring Motor. This motor is of particular use in the preparation of chemicals involving the use of liquids with high viscosity, since it has variable speed adjustment and also the ability to produce high torque at low speeds through a reduction gearbox.

Among the features incorporated in the motor are a dynamically balanced armature in sleeve bearings and integral fan cooling. A point of special interest is the combined bracket and bosshead, which permits the stirrer to be aligned in three different planes at right angles.

Three types of motor are available, each giving differing max./min. speeds and torque, but all three are sold at £15 10s.

Export Opportunities

In each case manufacturers should write direct, informing the British Trade Commissioner, whose address appears at the end of each item, that they have done so.

Belting for Canada

W. Friend, Fiberglas (Canada) Ltd., Guelph, Ontario, is interested in receiving British quotations for specialized synthetic rubber belting used on machinery in the manufacture of Fiberglas. Quotations should be made per 1,000 cif Toronto or Montreal, in dollars. 119 Adelaide Street West, Toronto. (Ref. ESB/36781/61.)

PVC Sheeting

Stuart Fell and Co. Pty. Ltd., 125 William Street, Melbourne, C.1, wish to get in touch with British manufacturers of pvc sheeting for use in the horticultural and agricultural industry, *i.e.* as a substitute for glass in nurseries and greenhouses.

Australia and New Zealand Bank Chambers, 224 Queen Street, Melbourne, C.1. (Ref. ESB/32606/61.)

Rubber Balls

L. R. Cox of Hub Agencies Ltd., PO Box 216, Moncton, New Brunswick, would like to represent British manufacturers of sponge rubber balls.

Room 728, Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1. (Ref. ESB/32406/61.)

Sheeting for South Africa

R. Nessel, PO Box 1007, Windhoek, would like to represent British manufacturers of plastics such as table covers, and window curtains for doors. He would also welcome offers for cheap as well as the better class textiles.

African Life Centre, 2 St. George's Street, Cape Town. (Ref. ESB/33252/61.)

Plastics Materials for Canada

Colin Shirriff Sales, 69 Eglinton Avenue East, Toronto IV, are interested in representing British manufacturers of the following: plastics packaging materials, cable insulating materials, industrial tapes.

119 Adelaide Street West, Toronto. (Ref. ESB/34116/61.)

Plastics Machinery

Paul Richter, managing director of Richter and Co. Ltd., 23-25 Phillips Street, Port of Spain, Trinidad, is interested in obtaining a supplying source for: 1 shot polyether flexible foam system for slab foam production in the small to medium range with an output of 3-8lb. per min.

P O Box 225, Port of Spain. (Ref. ESB/35804/61.)

Plastics, Sheet

Herr Fritz Mannes, Gerechtigkeitsgasse 14, Zurich, would like to represent British manufacturers of sheet plastics (grained/non-grained, with or without textile base) used by women's handbag manufacturers.

The British Consulate-General, Dufourstrasse 56, Zurich. (Ref. ESB/32728/61.)

Waist Bands and Plastics Handbags

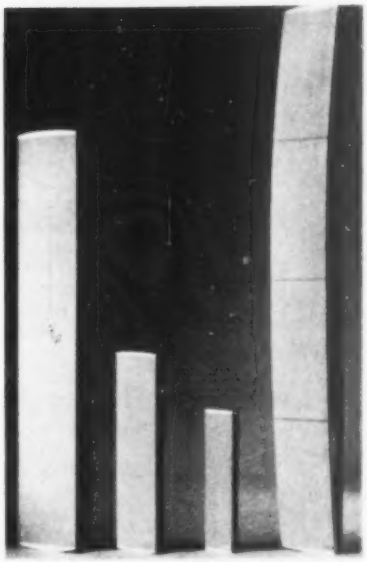
K. Lazar of Pyramid Agencies, 27 Yorkshire Insurance House, Stanley Avenue, PO Box 2312, Salisbury, is seeking agencies for rubberized waist bands and medium-priced women's plastics handbags.

RTA House, Bakery Avenue, Salisbury, S. Rhodesia, PO Box 984. (Ref. ESB/36855/61.)

Lebanon: Rubber Pipes

The firm of Assad Ibrahim Nassar, Rue Chanti, off Rue Aiz, Beirut, is seeking agencies of British manufacturers of rubber pipes for air compressors and irrigation purposes.

The Commercial Department, British Embassy, Corniche du Phare, Beirut. (Ref. ESB/37773/61.)



The Westrex Co. has just introduced a completely new range of high quality speakers. The cases are made from glass reinforced polyester resin and the baffles are of resin bonded plywood

British Standards

Electrically Bonded Hose BS 3395

BS 3395 lays down requirements for electrically-bonded delivery hoses and hose assemblies primarily intended for roadside petrol pumps. The nominal bores of the hoses are ¾in. and 1in.

The hoses are intended for service at ambient temperatures between −26°C. and +55°C. when dispensing fuels having aromatic hydrocarbon contents not exceeding 60% by volume. The outside and inside diameters of the hoses are closely defined in order to ensure interchangeability of couplings.

The standard specifies the requirements for three types of hoses, all having smooth bores and smooth outer covers but differing in their coiling, reeling and dilation properties according to the type of reinforcement that is employed in their construction: Type 1 is for hose having textile reinforcement only (designed for reeling on a drum or draping in a single loop). Type 2 is for hose having both textile and helical wire reinforcement (designed for torsional flexibility, and suitable for coiling, reeling on a drum or draping in a single loop). Type 3 is for hose having fine wire reinforcement only (designed for low dilation, and suitable for reeling on a drum or draping in a single loop).

The standard applies both to hoses supplied in random lengths without couplings and to hose assemblies of specified lengths with factory-fitted couplings.

Sheet and Tile Flooring

Plastics flooring is included in a new edition of the British Standards Institution's code of practice for sheet and tile flooring (CP 203).

This code will be of great value to all concerned with the selection and laying of the following floorings in sheet or tile form: linoleum, cork carpet and felt-backed linoleum; cork; rubber; thermoplastic tiles, sometimes known as 'asphalt tiles'; vinyl asbestos tiles; flexible pvc.

No recommendations on the laying of electrically conductive or antistatic flooring are included.

The code does make recommendations on the selection of various types of floor coverings and underlays to suit the different types of bases on which they might be laid. The treatment of bases and the method of using underlays are discussed.

Information has also been given on the use of adhesives for fixing both underlays and the floor covering, and is supported by a table of the types of adhesives commonly used.

It has been found that, in practice, many flooring failures are attributable to dampness. The code therefore gives recommendations for the protection of the flooring against rising ground moisture in addition to a method of determining the dryness of a concrete screed before the flooring is laid.

A new code dealing with the care and maintenance of floor surfaces is now in the course of preparation. Pending its publication, the existing code carries some interim recommendations.

Copies of these Standards may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1, price 5s. each.

Companies in the News

Daniels' Stock

Dealings started recently on the London Stock Exchange in the £300,000 7¼% mortgage debenture stock, 1981-86, and £375,000 ordinary capital in 5s. shares, of T. H. and J. Daniels.

It is understood that the proportions being made available in the market will comprise £60,000 debenture stock at £100½% and 90,000 ordinary shares at 7s. 7½d. each. After the marketing, the chairman and his family will continue to be the controlling shareholders.

Canadian Asbestos

Canadian producers' shipments of asbestos increased 20.75 in October to 120,981 tons from 100,242 in the corresponding month last year, and 4.7% in the January-October period to 952,126 tons from 909,368 in the like 10 months of 1960. Shipments from mines in Quebec advanced 20.5% in the month to 114,927 tons from 95,361 a year earlier, and 4.5% in the 10-month period to 893,153 tons from 855,067 a year ago.

Calls for Tenders

Polythylene for S. Africa

Pipe-grade polythylene which is first-grade virgin to SABS533/1957, is required by the Chief Buyer, Stewarts and Lloyds of South Africa Ltd., PO Box 74, Vereeniging, to whom bids should be sent.

Closing date: January 31 1962. (Ref. ESB/36924/61.)

Future Events

Plastics Institute

Midland Section.—Reinforced Plastics Group. December 28, at the James Watt Memorial Institute, Gt. Charles Street, Birmingham 3, at 7 p.m. 'Survey of New Developments in Resin', by H. R. Everard (BIP Chemicals Ltd.).

Plantation Newsletter

Last week Plantation Newsletter, referring to the effect that any price-cutting of natural would have on the smallholders, quoted the Smallholders' Council as saying that yield averaged less than 400lb. an acre on smallholdings. With rubber at 80 cents a lb. this means that a man with four acres earns only $56 a month — which is, of course, about £6 10s., and not £66 as was stated.

Owing to an early press date for Christmas, it has not been possible to include Plantation Newsletter this week.

STOCK MARKET

Continued from page 1029

peak prices that were going during the time of the May boom. Most, however have held on through the setback that followed and must now be looking forward to better times in the coming next 12 months. Though we are not clear of the wood by a long way yet, I somehow have that feeling that 1962 will see things picking up with equities regaining some of their long-lost glories.

NEW COMPANIES

Automotive Chemical Aids Ltd. (707,340). November 6. Capital: £100 in £1 shares. To carry on the business of manufacturers of products associated with and used by the motor industry, etc. The directors are: Clifford Schofield and Jean Schofield, both of 8 Stand Avenue, Whitefield, Manchester (directors of Lacquer Developments Ltd., etc.). Regd. office: Hope Mill, Water Street, Radcliffe, Manchester.

Geoffrey Newsome Ltd. (707,445). November 7. Capital: £1,000 in £1 shares. To carry on the business of manufacturers of and dealers in plastic foam products, etc. The directors are: Geoffrey Newsome, 48 Laurel Drive, Batley; Charles A. Fildes, 27 Delphfields Road, Appleton, Ches. Regd. office: 440 Bradford Road, Batley, Yorks.

Decorative Foam Pax Ltd. (707,543). November 7. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in textile fabrics and materials, plastics, foam rubber and synthetic materials, etc. The first directors are to be appointed by the subscribers. Regd. office: 11 Southampton Row, W.C.1.

Increases of Capital

Tyre Services (Carlisle) Ltd. (480,259), Durranhill Industrial Estate, Carlisle. Increased on June 1 1961, by £19,900 in £1 ordinary shares, beyond the registered capital of £100.

Hygiene Plastics Ltd. (474,423), Parr Bridge Works, Mosley Common Road, Boothstown, near Manchester. Increased on June 19 1961, by £8,000 in 6,000 8% redeemable preference and 2,000 ordinary shares of £1, beyond the registered capital of £2,000.

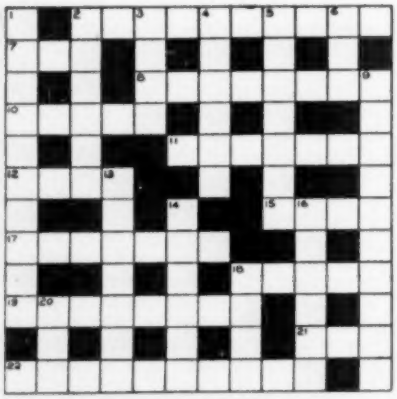
J. and W. Kavanagh (Tyres) Ltd. (650,261), Gibraltar Street, Sheffield. Increased on May 31 1961, by £900 in £1 shares, beyond the registered capital of £100.

D. H. Ridout and Son Ltd. (419,422), manufacturers of plastics, etc., 12 Stedman Road, Southbourne, Bournemouth. Increased on July 3 1961, by £10,000 in £1 ordinary shares, beyond the registered capital of £5,000.

Thurgar Bolle (Successors) Ltd. (443,101), manufacturers of plastic products, etc., Orient House, Field Street, Kettering, Northants. Increased on June 15 1961, by £50,000 in 2s. ordinary shares, beyond the registered capital of £150,000.

Waltham Rubber and Plastics Ltd. (202,324), Wangye Works, High Road, Chadwell Heath. Increased on July 1961, by £5,000 in £1 ordinary shares, beyond the registered capital of £10,000.

RPW CROSSWORD



CROSSWORD No. 81

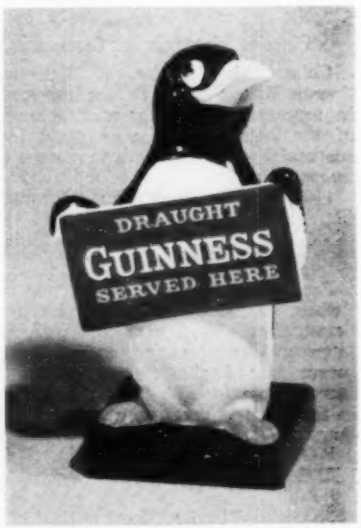
CLUES ACROSS

2.—Mackintosh did this to cloth.
7.—Sinter takes this untruth to be resilient.
8.—Methyl, ethyl, butyl.
10.—Facial features.
11.—Be unwell in the middle of the preview.
12.—The Channel girl.
15.—The seat changes direction.
17.—A batsman in form usually has a good one.
18.—It's a great day for them.
19.—Knock them down, a number first.
21.—None by the sound of it for her.
22.—The tendency of a magnetic substance to remain in a certain magnetic condition.

CLUES DOWN

1.—This at break is of importance in the physical testing of rubbers.
2.—Very nearly arson. Think about it is the answer.
3.—SBR. A mix up in them on Saturday night?
4.—Last but finish first.
5.—Lean incorporated first.
6.—The fish of the white elephant.
9.—1 down is attained with this.
13.—Nine met to be outstanding.
14.—Not prettier; 7 across within.
16.—The strangers are saline again.
18.—A goddess is double.
20.—Climber.

(Solution appears on page 1033)



This vinyl moulded Guinness penguin is manufactured by Cascelloid, of Leicester, and stands about 6½in.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

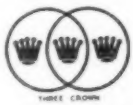
Farobase (823,716). Adhesives having priming properties, for use in industry. T. and W. Farmiloe Ltd., Nine Elms Works, 88 Nine Elms Lane, London, S.W.8. (Class 1; November 8 1961.)

Pyracoust (818,597). Heat-insulating and sound-deadening materials. Cafferata and Co. Ltd., Newark, Nottinghamshire. (Class 17; November 8 1961.)

Modern Miss (811,857). Devices made principally of plastics for holding flowers in vases or in the like receptacles, and food whisks included in Class 21. William James Gardner, 61 Rothwell Road, Gosforth, Northumberland. (Class 21; November 8 1961.)

Hellerman (B820,400). Material composed principally of plastics for binding, insulating and identifying electric cables, pipelines and the like. Hellermann Ltd., Gatwick Road, Crawley, Sussex. (Class 17; November 8 1961.)

Porelon (813,097). Chemical substances or preparations for use in the manufacture of micro-porous plastics embodying entrapped liquids. S. C. Johnson and Son Inc., 1525 Howe Street, City of Racine, State of Wisconsin, USA. Address for service is c/o Haseltine, Lake and Co., 28 Southampton Buildings, Chancery Lane, London, W.C.2. (Class 1; November 8 1961.)



(822,244). Tubes made of plastics; and mouldings and extrusions made of plastics; all included in Class 17. P. H. Muntz and Barwell Ltd., Alexandra Works, West Bromwich, Staffordshire. (Class 17; November 8 1961.)

Sheik (822,835). Appliances made of rubber or of other membranous substances, for prophylactic purposes. Julius Schmid Inc., 423-439 West 55th Street, New York, State of New York, USA. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. (Class 9; November 8 1961.)

Solo (815,363). Articles included in Class 17 made of plastics and manufactured by die-casting, pressing, drawing, punching and injection casting. Solo Zundwaren- und Chemische Fabriken Aktiengellschaft, 72 Unionstrasse, Linz a/Donau, Austria. Address for service is c/o W. Symmons and Co., 329 High Holborn, London, W.C.1. (Class 17; November 8 1961.)

Spurtal (818,762). Tubes included in Class 17 for use in the vulcanization of tyres. Veb Reifenwerk Fürstenwalde, Tränkeweg, Fürstenwalde-Süd (Spree), Germany. Address for service is c/o H. A. L. Venner, 1 Great James Street, Bedford Row, London, W.C.1. (Class 17; November 8 1961.)

Synrext (832,813). Lubricants for use in the formation of rubber substitutes and of plastics piping. Rex Campbell and Co. Ltd., 7 Idol Lane, London, E.C.3. (Class 4; November 8 1961.)

Velvafoam (811,619). Cushions (upholstery), pillows (not for surgical or curative purposes), mattresses, bolsters, pads for upholstery, baskets, bed-rests and head-rests, and sleeping bags; all made wholly or principally of foamed plastics. Pritex (Plastics) Ltd., Stablegrove Mills, Wellington, Somerset. (Class 20; November 8 1961.)

Farobase (823,716). Adhesives having priming properties, for use in industry. T. and W. Farmiloe Ltd., Nine Elms Works, 88 Nine Elms Lane, London, S.W.8. (Class 1; November 8 1961.)

Porelon (813,097). Chemical substances or preparations for use in the manufacture of micro-porous plastics embodying entrapped liquids. S. C. Johnson and Son Inc., 1525 Howe Street, City of Racine, State of Wisconsin, USA. Address for sevice is c/o Haseltine, Lake and Co., 28 Southampton Buildings, Chancery Lane, London, W.C.2. (Class 1; November 8 1961.)

Synrex T (832,813). Lubricants for use in the formation of rubber substitutes and of plastic piping. Rex Campbell and Co. Ltd., 7 Idol Lane, London, E.C.3. (Class 4; November 8 1961.)

(B814,162). Chemical products and adhesive substances, all for use in industry. Adhesive and Allied Products Ltd., 2-4 Highbridge Road, Barking, Essex. Class 1; November 8 1961.)

Arrcolene (817,667). Plastics included in Class 1 for use in manufactures. The Rubber Regenerating Co. Ltd., First Avenue, Trafford Park, Manchester, 17. (Class 1; November 8 1961.)

Parez (B815,864). Synthetic resins for use in manufactures. American Cyanamid Co., 30 Rockefeller Plaza, City of New York, State of New York, USA. Address for service is c/o Stevens, Langner, Parry and Rollinson, 5 to 9 Quality Court, Chancery Lane, London, W.C.2. (Class 1; November 8 1961.)

Black Prince (822,528). Sheet materials of plastics included in Class 17 for use in agriculture and horticulture. Polyglaze Ltd., Factory 18 Victoria Rad, Burgess Hill, Sussex. (Class 17; November 8, 1961.)

Defanto (818,760). Tubes included in Class 17 for use in the vulcanization of tyres. Veb Reifenwerk Fürstenwalde, Tränkeweg, Fürstenwalde-Süd (Spree), Germany. Address for service is c/o H. A. L. Venner, 1 Great James Steet, Bedford Row, London, W.C.1. (Class 17; November 8 1961.)

Evotape (818,919). Insulating tape. Evode Ltd., Common Road, Stafford. (Class 17; November 8 1961.)

'Duradur' (815,519.) Coverings to prevent radiation of heat; rubber covers for cylinders; non-metallic hose pipes and patching material therefor; insulators; jointings, linings, packings, non-metallic valves and washers, all included in Class 17; packing rings and packing sleeves; stuffing devices; and rubber tubing. Hans Pahl, trading as Pahl'sche Gummi-und Asbest-Gesellschaft 'Paguag', 41 Gatherhof, Düsseldorf-Rath, Germany. Address for service is c/o Heron Rogers and Co., Bridge House, 181 Queen Victoria Street, London, E.C.4. (Class 17; November 8 1961.)

Latest Wills

Mr Charles Henry Glassey, FPI, of 52 Viceroy Close, Bristol Road, Edgbaston, Birmingham, chairman of British Industrial Plastics Ltd., who died on July 3, left £43,065 gross, £35,871 net value.

Mr George Arthur Lawrence Ramsey, of 1 Trowbridge Road, Bradford-on-Avon, Wilts., catering manager at the Avon India Rubber Co. factory, Bradford-on-Avon, who died on July 28, left £3,013 gross, £1,230 net value.

Rubber Markets

The Christmas holidays have made it necessary to go to press early this week. Rather than print rubber market prices nearly one week out of date it has been decided not to publish this regular feature this week. Up-to-date information will appear in *RPW* December 30.

Solution to RPW Crossword

(See page 1032 this issue)

ACROSS.—2, Rubberized. 7, Lie. 8, Radicals. 10, Noses. 11, Trailer. 12, Anne. 15, East. 17, Innings. 18, Irish. 19, Ninepins. 21, Nun. 22, Hysteresis.

DOWN.—1, Elongation. 2, Reason. 3, Bars. 4, Endure. 5, Incline. 6, Eel. 9, Stretching. 13, Eminent. 14, Uglier. 16, Aliens. 18, Isis. 20, Ivy.

CROP RETURNS

Unless otherwise indicated, the figures quoted, to the nearest thousand lb., represent crop returns for the month stated and for the number of months of the planting company's financial year to date. Corresponding figures are given in parentheses.

INCH KENNETH KAJANG RUBBER LTD.

September

Kemasul Rubber Estates Ltd.—273 (258).

SHARPE, ESTALL & CO. LTD.

October

Anglo-Johore Rubber Plantations—50 (42). 4 mths—201 (157).

Bekoh C.R.E. Ltd.—255 (221). 7 mths—1,563 (1,439).

K.P.R.P. Ltd.—73 (77). 7 mths—458 (462).

Rim (Malacca) R. F. Ltd.—288 (266). 4 mths—1,065 (1,053).

Sittang Valley R.E. Ltd. — 154 (144). 4 mths—164 (188).

Kurunegala Rubber Co. (1929) Ltd.—30 (31). 10 mths—257 (274).

Beau Sejour Rubber Co. Ltd.—33 (73).

Kuala Reman Rubber Estates Ltd.—130.

COUNTY COURT JUDGMENTS

NOTE.—*These Judgments which are supplied from the Registry of County Court Judgments, Lord Chancellor's Department, 3 Dean's Yard, London, S.W.1, are not necessarily for debt, and some may have since been satisfied. They may be for damages or otherwise, they may relate to actions bona fide contested between the parties, or they may be against defendants liable in a representative capacity and not personally, but no distinction is made on the register. A judgment does not imply inability to pay. Judgments are not returned to the Registry if satisfied in Court Books within twenty-one days.*

Thomas George Beech, 6 Porlock Road, London, W.10, tyre dealer, Watford, £141, June 14 1961.

H. A. Pennock (H.F. Welders) Ltd., 34 Greenwich High Street, London, S.E.10, plastic manufacturer, Woolwich, £40, September 14 1961.

This polythene squeeze bottle has a new polythene dispenser-spreader with a serrated edge. It is being supplied by the Metal Box Co. Ltd. for A. Wilme Collier Ltd., the manufacturers of Gloy paste

CLASSIFIED ADVERTISEMENTS

RUBBER AND PLASTICS WEEKLY

APPOINTMENTS VACANT

8d. a word, Minimum 12/- Box 2/-

ASSISTANT plant engineer required by rubber manufacturers situated in Hertfordshire. Previous experience desirable of maintenance of machinery for the production of mandrel made braided hose, mouldings and mechanicals, and applicant must have previous general engineering experience in a rubber manufacturer's plant. Essential to have qualifications of AMIMechE or HNC level. For the successful candidate this post carries good prospects for very quick promotion, with ultimate responsibility for plant installation and maintenance, equipment design, development and all enginering staff. Applicant who is married and aged between 25 to 35 years will be preferably considered. Accommodation available after promotion. Contributory pension scheme, canteen facilities and bonus scheme.—Apply giving full details of age, education and experience to Electric Hose and Rubber Co. Ltd., Harpenden, Herts. (073)

RUBBER technologist, preferably of AIRI standard, with up-to-date knowledge of compounding and processing natural and synthetic rubbers, required for factory specialising in precision mouldings and seals. This is a senior position with appropriate salary and pension scheme.—Apply in first instance to Joseph Lucas (Electrical) Ltd., Chandos Road, Willesden Junction, London, N.W.10. (239)

RUBBER technologist required by old-established rubber hose manufacturers in Hertfordshire for process control and laboratory development. Suitable for young man of 20/25 years, but must be semi-qualified to LIRI standard. Time will be allowed for study to AIRI level in London. Excellent prospects are offered to a man showing keenness, energy and with ability to shoulder responsibility. Contributory pension scheme, canteen facilities, good salary and bonus scheme.—Apply giving full details of age, education, training and experience to Electric Hose and Rubber Co. Ltd., Harpenden, Herts. (072)

APPOINTMENTS VACANT

(continued)

SPONGE production. A chemist with good experience of sponge and a technician similarly qualified are urgently required by growing company in country district. Excellent working conditions and pension arrangements.—Write with full details of career and salary required to Box 229. (229)

THE Avon India Rubber Co. Ltd. has vacancies for technical assistants to work on process and product development. Experience in the rubber industry would be an advantage, but is not essential. An educational standard equivalent to LIRI is desirable.—Applications giving age, qualifications, experience and salary required should be addressed to The Staff Manager at Melksham, Wilts. (233)

VACANCY in expanding rubber factory situated South London for experienced foreman in calender and mixing shop. Experience in press shop an advantage. Excellent opportunity for right applicant. Salary according to experience. Bonus and pension scheme in operation.—Apply in confidence to Box 214. (214)

This column can be YOUR best BUYER or SELLER

RUBBER & PLASTICS

MACHINERY

Why not see for YOURSELF

MACHINERY FOR SALE

8d. a word, Minimum 12/- Box 2/-

COVENTRY Climax forklift trucks. Diesel and petrol models. 6ft. to 12ft. lifts. 2,000lbs. to 6,000lbs. capacity. Details and photograph available. Part exchanges arranged.—Speed Electrics, Church Street, Basford, Nottingham. Tel. 75716. (217)

CLASSIFIED ADVERTISEMENT FORM

Please keep for future use if not required immediately

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35

AUCTIONS and TENDERS 38s. 6d. MINIMUM · **OTHER HEADINGS 12s. MINIMUM** · ..... **words @ 8d. per word**

BOX No. 2/- EXTRA *Total Cost*.....

Name.....

BLOCK LETTERS PLEASE

Address.....

.....

MACHINERY FOR SALE

(continued)

3,500 TON 5-daylight hydraulic hot press. Platens 6ft. x 4ft. Complete with pumps. Drawings and quotation on request.—Box 240. (240)

MANUFACTURERS of roughing machines for rubber sheeting, sponge rubber, splitting machines, leather cloth plant, embossing plates and rollers, spreading machines and presses.—G. L. Murphy Ltd., Imperial Works, Menston, Nr. Leeds. (238R)

Donald Leaver Limited

1 LONDON ROAD, STAINES, MIDDX. Phone STAINES 55271-2

FOR **SECONDHAND PLANT AND MACHINERY** (1057)

ARTICLES WANTED

8d. a word, Minimum 12/- Box 2/-

REGULAR quantities of all colours, Nitrile rubber waste.—Samples and details to Rushden Granulating Co. Limited, 21 Harborough Road, Rushden, Northants. Phone Rushden 3687. (241)

PVC *Sheeting scrap all types colour sorted and mixed regular quantities available*

MICHAEL S. STEVENS LIMITED

Station Works, 75c Upper Richmond Road, Putney, S.W.15

VANDYKE 6925 (739)

CAPACITY REQUIRED

8d. a word, Minimum 12/- Box 2/-

RUBBER cable manufacturers seek contact with PVC extruders, with capacity to extrude plastic sheath on approx. ¾in. dia. rubber cable in quantity.—Particulars to Box 238. (238)

ADVERTISERS

YOUR ANNOUNCEMENTS MAY BE DISPLAYED IN THE CLASSIFIED SECTION AT THE FOLLOWING RATES

PER INCH SINGLE COLUMN

1 INSERTION £3. 0. 0. 7 INSERTIONS £2. 15. 0. EACH

13 INSERTIONS OR MORE £2. 10. 0. EACH

OR AS LINES AT 5s. 6d. PER LINE

CAPACITY AVAILABLE

8d. a word, Minimum 12/- Box 2/-

ENQUIRIES sought for bulk production of rubber washers, automatically cut. Our machines can handle tubes of ¼in. bore up to 3in. o.d., with a cut of 1/16in. to 1in.—Enquiries to Box 236. (236)

MATERIALS WANTED

8d. a word, Minimum 12/- Box 2/-

LEATHER Components and Waste Ltd. W require regular quantities of the following rubber wastes: microcellular—all colours; gristle—all colours; resin—white and cream; any white rubber. All shades of all types of rubber waste, for sale from stock.—Offers with samples to 21 Harborough Road, Rushden, Northants. Phone Rushden 3687. (231)

Kautschuk und Gummi

Official Journal of the German Society of Rubber Chemists and Technologists
(Deutsche Kautschuk-Gesellschaft e.V.

the most quoted and authoritative

GERMAN RUBBER JOURNAL

KAUTSCHUK und GUMMI promotes international exchange of ideas concerning economic, technical and scientific problems involved in the different phases of the manufacture of rubber and asbestos products. Business experts and authorities in science and technology supply facts, opinions, and research results. Reports and information from the industries' various associations are included.

KAUTSCHUK und GUMMI is an excellent advertising medium which addresses itself to just those firms in the import and export trade whom you want to interest. Specimen copy and advertising rates on application to the publishers.

Kautschuk und Gummi

BERLIN-BORSIGWALDE, FRANKFURT am MAIN

ENGINEERS TO THE RUBBER AND PLASTICS INDUSTRY
LOW LOADING TRANSPORT AND MOBILE CRANES FOR HIRE
FACTORY REMOVAL INSTALLATION MAINTENANCE REPAIR
NEW MILLS SPECIAL MACHINES ALL TYPES SPARE PARTS

W. F. WEBB (ENGINEERS) LTD

WRITE
7 MANOR ROAD
SOUTH NORWOOD
LONDON S.E.25

TELEPHONE
ADDiscombe 1282
STAINES 55271
SWANDEAN 535

INDEX to ADVERTISERS

	Page
Abrasive Developments Ltd.	—
A.E.W. Ltd.	—
Allcock, J., & Sons Ltd.	—
Amalgamated Oxides (1939) Ltd.	—
Anchor Chemical Co. Ltd.	1011
Anderson, Joseph, & Sons Ltd.	iii
Armour Hess Chemicals Ltd.	—
Associated-Rediffusion Ltd.	—
Astor Boisselier & Lawrence Ltd.	—
Baker Perkins Ltd.	iv
Barwell Engineering Ltd.	—
Belgrave Industries (Exports) Ltd.	—
Berk, F. W., & Co. Ltd.	—
Berstorff, Hermann	—
B.I.P. Chemicals Ltd.	—
Birch, Singleton, W., & Sons Ltd.	—
Bone Bros.	—
Boston Marine & General Eng. Co. Ltd.	—
Bridge, David, & Co. Ltd.	1008
Bright, John, & Bros. Ltd.	ii
British Electrical Development Association	—
British Geon Ltd.	—
British Nylon Spinners Ltd.	—
British Recovered Rubber Co. Ltd.	—
British Resin Products Ltd.	—
British Titan Products Co. Ltd.	—
British Transport Commission	—
Bush Beach & Segner Bayley Ltd.	—
Cabot Carbon Ltd.	—
Carter Bros. (Rochdale) Ltd.	—
Catomance, Ltd.	—
Carlton Press Knives Ltd.	—
Chance & Hunt	—
Chemical & Insulation, Ltd.	—
C.I.C. Engineering Ltd.	—
Cleggswood Oil Distillery Ltd.	—
Cohen, George, Sons & Co. Ltd.	—
Columbian International (Gt. Britain) Ltd.	—
Consolidated Zinc Corporation (Sales) Ltd.	—
Courtaulds Ltd.	—
Crosfield, Joseph, & Sons Ltd.	—
Croxton & Garry Ltd.	1036
Derrick Davis Plastics Ltd.	—
Dietzel, Hugo	—
Distillers Co. Ltd., The	—
Dixon, T. H., & Co. Ltd.	—
Docker, John, & Co. (Engs.) Ltd.	1007
Dunlop Rubber Co. Ltd.	—
Du Pont Co. (United Kingdom) Ltd.	—
Durham Raw Materials Ltd.	—
Economist Intelligence Unit Ltd., The	—
Ellison, George, Ltd.	—
English Clays Lovering Pochin & Co. Ltd.	—
English Electric Co. Ltd., The	—
Esso	—
eur-O-matic	—
Fawcett Preston & Co. Ltd.	—
Felber Juker & Co. Ltd.	—
Ferguson, A. O., & Co. Ltd.	—
Ferguson, James, & Sons Ltd.	i
Ferguson Shiers Ltd.	—
Firestone Tyre & Rubber Co. Ltd.	—
Foamair Ltd.	—
Geigy Co. Ltd., The	—
Goodyear Tyre & Rubber Co. Ltd.	—
Greeff, R. W., & Co. Ltd.	—
Gresham & Craven Ltd.	—
Gummi und Asbest	—
H.F. Industrial Services Ltd.	—
H.K. Import & Export Ltd.	—
Halsteads Engineers (Leyland) Ltd.	—
Hankin, Geo., & Co. Ltd.	—
Hardman & Holden Ltd.	—
Harrison Jones	—
Hatcham Rubber Co. Ltd.	viii
Hay & Robertson Ltd.	—
Hilton, Wallace, & Co. Ltd.	vi
Hubron Rubber Chemicals Ltd.	Cover iv
Hughes & Hughes Ltd.	—
Hunt Heat Exchangers Ltd.	—
Iddon Bros. Ltd.	—
Iliffe Industrial Publications Ltd.	—
Imperial Chemical Industries Ltd. (Billingham)	x
Imperial Chemical Industries Ltd. (Dyestuffs)	—
Imperial Chemical Industries Ltd. (Plastics)	—
Imperial Chemical Industries Ltd. (Terylene)	—
Institution of the Rubber Industry	—
International Corporation Ltd.	—
International Synthetic Rubber Co. Ltd.	Cover i
Ioco Ltd.	vi
K.W. Chemicals	—
Kautschuk und Gummi	1035
Kendell, T., & Sons Ltd.	—
Ketjen Carbon	—
Kuala Lumpur-Kepong Amalgamated Ltd.	—
Lankro Chemicals Ltd.	—
Laporte Titanium Ltd.	—
Latex Engineering Co.	—
Lavino (London) Ltd.	—
Leader, Denis, Ltd.	—
Leaver, Donald, Ltd.	—
Leeds & Bradford Boiler Co. Ltd., The	—
Lindsay & Williams Ltd.	—
Lonabarc Ltd.	—
Londex Ltd.	—
London & Scandinavian	—
Lord, R., & Sons Ltd.	—
McKechnie Bros. Ltd.	—
Maclaine, Watson & Co. Ltd.	—
Merkle, P. W., Ltd.	—
Mersey White Lead Co. Ltd., The	—
Metal Box Co.	—
Micafine Ltd.	—
Monsanto Chemicals Ltd.	—
Morton Machine Co. Ltd.	—
Muehlstein, H., & Co. (London) Ltd.	—
Muller, Max	—
Natural Rubber Bureau	—
New Conveyor Co. Ltd.	—
Noble Lowndes Pension Service, The	—
Northwestern Rubber Co. Ltd.	—
Novadel Ltd.	—
Oakes, E. T., Ltd.	—
Oswald & Duncan Ltd.	—
Philblack Ltd.	—
Phoenix Rubber Co. Ltd.	—
Planters Engineering Co. Ltd.	viii
Polymer (United Kingdom) Ltd.	—
Preston Tyre Fabric Manufacturing Co. Ltd.	—
Price's (Bromborough) Ltd.	—
Pullen, James H., (1942) Ltd.	vi
Quick-Wrap Tubing Co. Ltd.	—
Reed Bros. (Eng.) Ltd.	—
Revue Generale du Caoutchouc	—
Rhein-Chemie GmbH.	—
Robinson Bros. Ltd.	—
Ro-Search Inc.	—
Robinson, Joseph, & Co. Ltd.	1019
Rotunda Ltd.	—
Rubber Age (New York) Ltd.	viii
Rubber Estate Agency Ltd.	—
Rubber Latex Ltd.	1026
Rubber Regenerating Co. Ltd.	Cover ii
Scott Bader & Co. Ltd.	—
Sealants Ltd.	—
Shaw, Francis, & Co. Ltd.	—
Shell Mex & B.P. Ltd.	—
Shell Chemical Co. Ltd.	—
Shell International Chemical Co. Ltd.	—
Smith, Alfred, Ltd.	vii
Smith, Wilfrid, Ltd.	—
Squire, Frederick, Ltd.	—
Stechler, L., & Co. Ltd.	—
Steel, J. M., & Co. Ltd.	—
Steele & Cowlishaw Ltd.	—
Stocker, W. B., & Co. Ltd.	—
Storeys of Lancaster	—
Stott, James, Ltd.	—
Sturge, John & E., Ltd.	—
Sussex Rubber Co. Ltd.	—
Sutcliffe Engineering Components Ltd.	—
Sutcliffe Speakman & Co. Ltd.	—
Tanner Bros. (Greenfield) Ltd.	ix
Tilghman's Ltd.	—
Union Carbide Ltd.	—
United Norit Sales Corporation Ltd.	—
United Wire Works Ltd., The	—
Universal Oil Co. Ltd.	—
Universal Oil Products Co.	v
Vacu-Blast Ltd.	—
Verson Engineering Co. Ltd.	—
Wallace, H. W., & Co. Ltd.	—
Wallis Engineering Co.	—
Washington Chemicals	—
Webb, W. F. (Engineers) Ltd.	1035
Welwyn Tool Co. Ltd.	—
Whiffen & Sons Ltd.	—
Witco Chemical Co. Ltd.	1024
Zama Ltd.	—

MICROMYA
OMYA BSH

The finest natural whiting in the world

Has the patented coating

From the French Quarries and Factories of the OMYA Organization
HEAD OFFICE: PLUESS-STAUFER, A.G., OFTRINGEN, SWITZERLAND

Samples and Literature from:

CROXTON and GARRY LTD.,
27 St. James Road, Kingston-on-Thames
Surrey
KINgston 9444 (4 lines)

for the bookshelf—

SELECTED TITLES FOR ALL CONCERNED WITH RUBBER AND PLASTICS

BOOKS

ENGINEERING DESIGN with RUBBER

The first theoretical examination of an increasingly important subject to appear in book form, this work has also been designed to be a practical manual for engineers and rubber technologists faced with problems in rubber engineering design.

50/-
By Post 2/- extra

A. R. PAYNE, B.Sc., A.Inst.P., F.I.R.I., and J. R. SCOTT, Ph.D., M.Sc., F.R.I.C., F.Inst.P., F.I.R.I., Rubber and Plastics Research Association of Great Britain.

SYNTHETIC RUBBER TECHNOLOGY

Written to meet the need of rubber technologists primarily concerned with the compounding and processing of synthetic elastomers, this book is entirely practical in its approach to the subject. The elastomers considered are: SBR, High Styrene Resins, Butyl Rubber, Neoprene, Nitrile Rubber, Silicone Rubber, and Thiokol. A textbook and handbook to the Synthetic Rubber Industry.

50/-
By Post 2/- extra

Vol. I—Compounding, Processing and application of Standard Types
W. S. PENN, B.Sc.

The ANALYSIS of RUBBER and RUBBER-LIKE POLYMERS

The first modern work devoted solely to this important subject to be published in the English language. In addition to the analysis of natural and synthetic rubbers, the author deals with rubber-like plastics such as Polyethylene, PVC, PVDC, PVA and Polyurethanes. It has become a standard work and is a "must" for all analysts interested in this subject.

50/-
By Post 2/- extra

WILLIAM C. WAKE, M.Sc., Ph.D.(Lond.), F.R.I.C., F.I.R.I., Rubber and Plastics Research Association of Great Britain.

CONDUCTIVE RUBBER

For the research worker and the technologist this book provides a comprehensive outline of the knowledge which exists on the "conductive" or "antistatic" classes of rubber. *(Second impression.)*

20/-
By Post 1/6 extra

R. H. NORMAN, M.Sc., A.Inst.P., A.I.R.I., Rubber and Plastics Research Association of Gt. Britain

PROSPECTUSES CAN BE HAD ON REQUEST

Obtainable from :

RUBBER AND PLASTICS WEEKLY

BOOK DEPARTMENT

131 Great Suffolk Street, London, S.E.1

Telephone : HOP 5712

for—

- **LOW COST**
- **COOLER RUNNING**
- **SAFE PROCESSING**
- **FAST EXTRUSION**

choose—

UKARB 327

THE ORIGINAL

GENERAL PURPOSE FURNACE BLACK

Samples and full Technical Data from Sole Distributors

HUBRON RUBBER CHEMICALS LTD
WILFRID SMITH LIMITED

ALBION STREET, FAILSWORTH, Near MANCHESTER
Telephone: FAILSWORTH 2691 (5 lines) *Telegrams*: 'HUBRONRUB'

16 PHILPOT LANE *Telephone*: MANSION HOUSE 2064
LONDON, E.C.3 *Telegrams*: 'ACCOLLYST,' BILGATE, LONDON

Printed in Great Britain by F. J. PARSONS, Ltd., London and Hastings, and published by the Proprietors, MACLAREN & SONS, LTD., Maclaren House, 131 Great Suffolk Street, London, S.E.1